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LECTURE III.†

IN this lecture I shall try to apply the deductions of the former lectures to certain clinical conditions. In effect I believe I have shown three points: (1) That accentuated tonic conditions of muscle are liable to occur as the result of the conditions, reflexes, &c., described. (2) Such tonic conditions affect the muscles which operate on the thorax; no similar effect has been found in the diaphragm. (3) The persistent contractions of these muscles lead, as a rule, to an elevation of the whole or parts of the thorax. I have also shown that elevation of the thorax is unfavourable to the effective contraction of the diaphragm. There is thus a marked interrelation between the elevation of the thorax and defective diaphragm contraction, and the clinical conditions which I shall describe are equally related, and treatment will also show a good deal of common ground. I shall, however, separate as far as possible these two points, the result of tonic contraction on the one hand, from those of defective diaphragmatic contraction on the other, and I shall deal with the former and its connexion with pain forthwith.

TONIC CONTRACTION AND PAIN.

It is common knowledge that an overtired muscle will ache, but the conditions under which it will cause definite pain are but little understood. My evidence that these muscles do cause the pains of which patients complain is: (1) That the muscles in question can be felt to be in a state of tonic contraction. (2) That they are tender to pressure. (3) That pressure on them elicits or causes an exacerbation of the pain of which the patients complain, and is frequently recognised by them as their particular pain. (4) That taking the strain off the muscle and enabling it to relax produces a cessation of the pain.

It is generally recognised that pain arising in nerves or certain viscera may be felt locally or have a distal reference. Baker[23] showed that skeletal muscle can give rise to referred pain in the case of flat-foot. I have verified this in cases of that condition and also have found referred areas and vasomotor changes in other muscles, the abductor indices and trapezius. The areas of referred pains for these muscles were described in my paper on the "Anginal Syndrome."[24] In that paper I also described the areas of reference of pain for the respiratory muscles. Thus, as with other muscles, pain produced by tonic contraction of a respiratory muscle may be local or referred or both.

More interesting than the question of the reference of the pain is the fact that frequently patients will recognise the pain produced by pressure on a sensitive muscle as being *the* pain of which they have had experience, and of which they complain. Sometimes patients will even go further than recognising their own particular pain, and will give their interpretation of it in such expressions as "that prevents my swallowing," "that grips my throat," or "it presses on my heart," or "it prevents my breathing." The remarks quoted in the last sentence have been forthcoming as the result of pressure on a sensitive triangularis sterni in different cases, and it is remarkable that a sensitive muscle should, in different individuals, be capable of producing sensations so variously interpreted.

Pain from any tonic muscle does not appear immediately the tonic condition is developed. The intensity of the muscle action also plays a part. The pain from the tonic muscle lasts only as long as the muscle is in that state and commences to decline when the tonic condition relaxes. An ache may persist for some hours. In one of my examples of a tonic trapezius muscle giving referred pain, the pain was longer in appearing if the arm alone was held out than it was if in addition a watering-can was held in the hand. Therefore, as a rule, there are periods following the diminution of the operative cause in which the pain is absent. This is well known in connexion with the common type of pain arising from gastric conditions. Similarly pains arising from over-exertion resulting in dyspnœa are intermittent. In functional cases it is more liable to be constant because the mental condition continues to operate.

Static Conditions.

In the consideration of clinical conditions interpreted in the light of these lectures the first example I shall give is purely static. Spinal curvature in the dorsal region leads to a widening of the intercostal spaces on the convex side. I have found a number of such individuals who, about the age of 50, complain of varying degrees of pain in the chest, more marked on exertion.

Thus in the case of a lady who complained of pain in the left chest on walking up a certain hill to her home, it was found that there was a spinal curvature with the convexity to the left in the dorsal region. The left third intercostal was tender to pressure, and the second, third, and fourth intercostal spaces were more open than those on the right and the muscles were tonically contracted. Her pelvis was tilted which in turn was due to inequality in the length of the legs. Within a week of correcting this by the addition of half an inch to the heel she could negotiate the hill comfortably. When seen a month later the intercostal spaces on the right and left sides were similar; the muscles were inspiratory. Pain recurred when she neglected wearing the correction of the heel and again disappeared when the correction was employed. Anxiety over a son-in-law caused for a short time a temporary recurrence of pain, even when wearing the elevated heel.

The second instance I would bring forward is that of the prominent abdomen. If with this the shoulders are forward discomfort does not result. If, however, the shoulders are thrown back the ideal conditions ensue for accentuation of the thoracic type of breathing. The ache in the chest and pain in the neck, shoulders, and arms arising from the scalenes and intercostal muscles occur in these individuals, of whom the emphysematous and pregnant women are instances. It is an aphorism that the symptoms of emphysema are made worse by accretions of body-weight, a considerable part of which goes on to the abdomen. Reduction of the size of the abdomen tends to produce a more forward position of the shoulders in order to maintain the balance of the body. In due course Nature restores the balance of the pregnant woman. In many cases of this habit of body a sternal pain accentuated by pressure on the overtaxed triangularis sterni* has also been present. This muscle is one of the smaller muscles of expiration in the thoracic type.

Psychic Conditions.

The effect of persistent emotional reactions is well exemplified by the following case:—

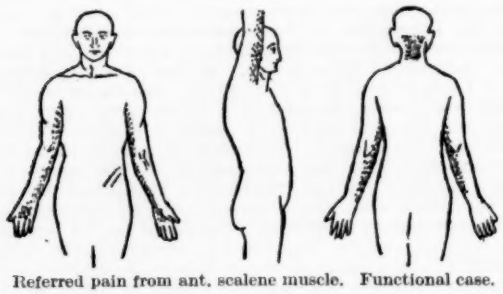
A girl of 27, a cashier, complained of pain in the palms of the hands, ulnar side of the forearms and internal arm, of persistent character day and night, and also of pains in the occipital region. The pains were accentuated by pressure on the scalenes and upper intercostals. At first she was

† Lectures I. and II. appeared in THE LANCET of March 26th and April 9th respectively.

* The asterisks throughout refer to points demonstrated by means of lantern slides.

thought to be an instance of occupation neurosis (Fig. 1). Her work involved standing all day and writing with the elbows unsupported. She was of the build and type of visceroptosis. A tracing of her chest showed marked thoracic type of breathing, and this abnormal breathing indicated the diagnosis, the pains being referred from the over-tonic muscles.

FIG. 1.



Referred pain from ant. scalene muscle. Functional case.

I shall refer to this case later under treatment. As stated in my second lecture, the respiratory habit of functional disease is thoracic, whether in men or women. Many cases showing this habit occurred during the war, and were discharged as neurasthenics.

Thus a man, aged 26, who was discharged in May, 1919, as neurasthenia, dated his illness from bronchitis in 1915 and sunstroke in 1916 and 1917. His complaint was that three or four times in a week he woke with a start, sat up and struggled for breath. There were no physical signs in the heart or lungs and there was entire absence of any epigastric protrusion on breathing. Pressure on the triangularis sterni produced pain and sensation of strangling. Instructions were given to remedy the defective action of the diaphragm. A fortnight later he reported "better sleep and on only two nights was there any wheezing." He was instructed to continue, and in a further month reported "no attacks and good sleep," and the pain was not produced by pressure on the muscle formerly tender.

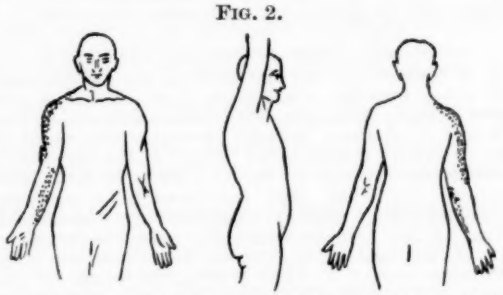
Another man discharged with D.A.H. complained of rapid heart on exertion or excitement, with pain in the upper part of the chest. The heart sounds were normal, the pulse 150. He again had lost diaphragmatic breathing, and the second intercostal space was markedly sensitive to pressure. He was given similar instructions, and five weeks later Dr. Wiltshire's note reads, "much better, pulse steady, 80 per minute." The heart had ceased to bother him 14 days after being first seen, and had only been troublesome on one occasion after having had two drinks with his father. A further note nine months after his first visit stated that he was keeping well and his breathing was normal. There were no pains in the chest.

Gastric Pain.—There is no need for me to do more than to remind you of the very large number of cases who complain of pain under the heart after food. As I have indicated in my second lecture, these originate from a persistent tonic condition of the fourth or fifth intercostal muscle. It is not clear why that part of the muscle which is in the nipple line should be most tender. This is the point at which the external intercostal muscle ends, for in the intercartilaginous space the place of this muscle is taken by fascia. This point is also the apex of the inverted arch formed by the rib and costal cartilage, an arch which is more narrow and is therefore deeper than that of the other ribs.

Pain of Pleurisy.—Nor is it necessary to give details of the acute pain of pleurisy. As I have stated, the muscles in the neighbourhood of a patch of pleurisy become tonically contracted. Pain is accentuated by pressure on the tonic muscle. Three points are, I think, worth mentioning. First, when pleurisy is located near the lower part of the sternum the triangularis sterni is particularly concerned in fixation, is tonically contracted, and gives rise to pain appreciated behind the sternum. I have seen three cases in which pain came on suddenly, as commonly occurs in pleurisy; in two cases pain was so acute as to cause the doctors to make a diagnosis of angina pectoris.* The third was not so intense, and was thought to be due to pericarditis. The second point is the frequency with which the onset of pleurisy at the base is accompanied by pain in the shoulder or arm* (Fig. 2). The third point is that apical pleurisy is also frequently associated with pains of similar distribution.* From the short description of muscle actions in pleurisy given in my second lecture, the origin of these pains in tonically contracted scalenes and upper intercostal muscle is readily appreciated. I here show the distribution of the pain in the arm arising as in a case of basal pleurisy, and in a case of apical pleurisy. Dr. Greenop, while resident at the City of London Hospital, investigated the question of referred pain in pleurisy (chiefly of tuberculous origin) in 50 cases. During the course of the attack pain was referred to the area over the shoulder in 32 cases—64 per cent. This is one of the areas I have described referred from the scalenes and upper intercostal muscles. In these 32 (1) pain was referred down the arm, as far as the wrist in two instances; (2) the pain was definitely accentuated by pressure on the scalenes in seven instances. The pain of pleurisy seems to be more intense in an individual of thoracic type.

Chest Pain on Exertion.—Pains occurring on exertion are commonly intensified and often recognised by pressure either on the triangularis sterni or on the scalenes, and, or on the upper intercostals, and more frequently on the left side. Thus a male infirmary patient, aged 56, who could not walk the length of the ward without getting pain in the sternal region, and being obliged to stand still, recognised his pain when the tonic triangularis sterni on the left side was pressed upon.* Similarly, a chemist aged 56, whose limit had been generally a hundred yards, but on occasions a quarter of a mile, recognised the pain which caused him to stand still. When the third left intercostal space was examined with the finger shortly after an attack, the pain was

FIG. 2.



Area of referred pain from the ant. scalene muscle on the right side. From a case of pneumonia affecting the right lower lobe 36 hours after onset.

produced and followed the usual course across the chest and down the left arm.

With advancing age and diminished elasticity of the lung there is a greater liability to symptoms of stress owing to the accentuation of strain on the thoracic muscles. As I stated in Lecture II., they are battling with an unyielding thorax, the result of calcification of rib cartilages. In general, the more a man inclines to the thoracic type through life the more will he be affected by this stress in advancing years, and if he has a positive Wassermann reaction the earlier in life will such symptoms occur, by reason of the early calcification. An apparent exception to this is seen in old people who give up thoracic breathing and rely on the diaphragm. This occurs as the thorax becomes completely fixed, is a sign of giving up the contest, and is accompanied by an amelioration of the previous pain on exertion. Much exertion is, however, impossible, and he refrains, not on account of pain, but because "I cannot get my breath."

Dyspnœa.—Turning now to dyspnœa, an important cause of shortness of breath, is an excessive

degree of thoracic breathing which promotes an associated ineffective diaphragm contraction.* The organism seems to attempt to remedy the defect rather by rapidity than by depth of respiration. Hence in excessive thoracic breathing the defect is perpetuated and panting ensues. In these dyspnœa is present on exertion. In talking a breath is taken too frequently, and, of course speaking when out walking is practically impossible. The pulse is rapid and may be irregular in size. Pains arising from the respiratory muscles are frequent at night when posture may accentuate the condition. Giddiness and a tendency to faint also occurs. Perhaps a few words may be said on the relationship of the circulation and respiration.

Respiration is, of course, developed as an accessory to the more important circulation. The supply of blood must be either by gravity, aspiration, or pumping action. The first two are more or less constant in any given position. The pump may vary. Considerable importance has been attributed [25] to the presence of positive intra-abdominal pressure whereby the blood is driven from the abdominal cistern up and to the heart. Such positive pressure is dependent on the walls of the abdomen, either muscular or connective tissue. In those tending to the thoracic type the diaphragm descends but little during inspiration, and the muscular parts of the abdominal wall are inactive. During expiration the muscles of the abdominal wall may be contracting but the diaphragm is inactive. Pressure can, therefore, never be high. In contrast the diaphragmatic type, in inspiration, contract the diaphragm and muscles of the abdomen simultaneously, but relax in expiration. In inspiration, therefore, the intra-abdominal pressure must be relatively high, but in expiration very low. If the diaphragmatic type changes to thoracic the intra-abdominal pressure and blood-supply will not be that to which he is accustomed. It is a surmise as to what may happen in any given case. From the clinical point of view cardiac rapidity frequently results. In the nervous as in life examination, the pulse can often be reduced from 100 to 70 by making the individual breathe with the diaphragm. In the case of a candidate for commission, suitable in every respect except for cardiac rapidity, the pulse under examination when supine was 130 per minute. By the means to be described later of making the diaphragm contract, the rate came to 80 at once. It is not my purpose to pursue this question further, but to offer a simple explanation for the symptoms in these cases, and to accentuate the point that when diaphragmatic action departs from the normal for the individual alteration in pulse may follow.

Thus excessive thoracic breathing promotes dyspnœa under many different circumstances. I suggested this mechanism as being a possible factor in cardiac dyspnœa. I believe it is the main factor in pregnancy, emotional conditions, and the convalescent stage of pleurisy.

Before passing to consider treatment, we may summarise our conclusions. An inspiration must continue until a certain amount of air has passed into the lungs, and when this has been attained the inspiratory act will cease. There is a selective action residing in the muscles dependent on the stretch under which they may be, and this decides whether that muscle or its neighbour will contract. If the inspiration is prolonged the muscles which were under a diminished degree of stretch at the commencement of the act will eventually be called into action. The diaphragm is the principal muscle of respiration, and respiration should be carried out by means of contraction of the dome of this muscle. Conditions extraneous to the respiratory system proper arise, in which the normal relationships of stretch in the respiratory muscles are altered. This leads to a substitution of the mechanism of the thorax at the expense of the diaphragm and induces dyspnœa. This substitution compels certain muscles of the thorax to action not inherently natural to them and of the nature of persistent tonic spasm. Excessive tonic contraction, if it persists, gives rise to tenderness on palpation and to subjective pains which may be local or referred.

CONCERNING TREATMENT IN GENERAL.

It is obvious that if I am correct in my views that persistent tonic contraction of muscles is the cause of pain and excessive thoracic breathing of disability as mentioned above, these symptoms should be relieved by any means through which strain is removed and the muscles are enabled to relax. The tonic muscles are those connected to the thorax, and so concerned with thoracic respiration. Relief can be afforded in two ways: (1) by promoting increased contraction of the diaphragm; (2) by mechanical means instituted for the direct relief of strain.

There should, of course, be no impediment to the descent of the diaphragm. Clothes on the abdomen should be loose. This applies as much to men's clothing as to that of women. The tape of pyjamas should be fastened quite loosely at night, and the leather belt, so frequently adopted and looked upon as a charm by the labourer, should be given up. The latter is usually a continuation of the mode adopted in youth, when the respiratory mechanism is very labile and capable of free accommodation. Such a belt is useful in youth to promote a development of the upper part of the thorax, which is thus forced into action at the expense of the diaphragm. It should not be allowed after the age of 40.

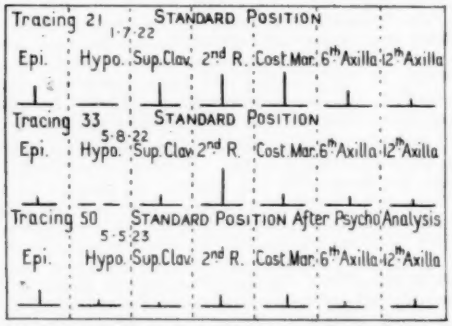
RE-EDUCATING THE DIAPHRAGM.

Under this heading also comes the question of training people to contract the diaphragm. There are a certain number of people, such as asthmatics, and individuals who have had some inflammatory condition in the chest, in whom the diaphragm appears to be inactive or to be what may be described as lazy. There is no doubt that training the diaphragm to contract voluntarily is most important and leads to good results. I would, however, say a word of caution on the means by which this should be produced. It is well known that if an individual is directed to take a deep breath, in the majority of cases this instruction is obeyed by a big thoracic elevation and without any protrusion of the epigastrium. From the result of considerable experience I am quite sure that at first no mention of breathing should be made. The individual should be directed to push out the abdomen. In some cases this command cannot be obeyed until after considerable encouragement. It is the more easily carried out with the patient in a semi-recumbent position, with the back not extended—i.e., not on a flat back bench, but on one which is rendered hollow so that the spine will not be extended. This exercise should not be persisted in for too long a time. Volitional efforts at respiration produce fatigue. Instructions should therefore be given that four or five efforts at a time should be made for a few days and afterwards be increased. It is advisable to fix definite periods, such as when the clock strikes the hour, before meals, &c. I mention this with some detail because when an individual has acquired a faulty habit of voluntary breathing, especially after instruction, it is frequently difficult to get him to revert to the proper type.* I have found this treatment beneficial in cases of asthma and it should be continued till the individual has a complete volitional control of his respiratory mechanism, so that he can on command contract the diaphragm to the full. I have not met the asthmatic patient who can stop his attack by voluntary breathing in this manner, but I have seen several who can abort an attack if they wake up before it has fully developed, and this remains a permanent feature of their disease and cannot be considered as one of the transient benefits of psychic influence.

Still under the first heading of promoting a contraction of the diaphragm I must refer to the much debated question of the value of psycho-analysis.

I show you a slide of a patient to whom I referred formerly. She was first seen for pains in the arms and neck. The first and second show you her type of breathing when first seen, which is nearly purely thoracic, and the third shows you the type of breathing after psycho-analysis by Dr. Strauss. Her neurosis was due to repressed fear. The experience which frightened her was the falling of a bomb near

FIG. 3.


Tracing 21 STANDARD POSITION
1·7·22
Epi. Hypo. Sup.Clav. 2nd R. Cost.Mar. 6th Axilla 12th Axilla
Tracing 33 STANDARD POSITION
5·8·22
Epi. Hypo. Sup.Clav. 2nd R. Cost.Mar. 6th Axilla 12th Axilla
Tracing 50 STANDARD POSITION After Psycho Analysis
5·5·23
Epi. Hypo. Sup.Clav. 2nd R. Cost.Mar. 6th Axilla 12th Axilla

Effect of psycho-analysis. First and second tracings before, third after, psycho-analysis. In the latter the thoracic movement is markedly decreased.

her during an air raid. The emotional component of the experience had undergone the process of repression. The change in her general condition which followed this treatment, and the relief of pain arising from the upper respiratory muscles, was most remarkable (Fig. 3).

No case in which pleurisy or pericarditis have developed should be allowed to get up before he can produce a satisfactory protrusion of the abdomen, by whatever means procured.* In children a return to the method of progression of their original progenitors—on hands and knees, is useful, but such means are not favoured by adults.

Not infrequently in clinical work we have to deal with a marked condition of this kind which may be termed "lazy diaphragm." It is apt to follow severe conditions of pleurisy, pericarditis, and abdominal operations. I would remind you of the Japanese treatment for this condition of lazy diaphragm, which consists in inserting an exploratory needle into one of the lower intercostal spaces. I have tried this method in two cases only, and with success. In them shortness of breath persisted after operation. It is quite possible that the axillary portion of the diaphragm can become overstretched and not be in a condition to react to a nervous impulse, and that a local stimulus of the nature of an exploratory needle promotes a contraction which is followed by a shortening of the fibres, and a suitable degree of stretch is reinstated.

1. *To Promote Contraction of the Diaphragm.*—In all except the most marked cases, thoracic breathing can be converted to diaphragmatic by simply depressing forcibly the lower ribs towards the pelvis (Fig. 4). This procedure prevents the full thoracic mechanism coming into play, and so the diaphragm must perforce contract. The muscle-fibres arising from these ribs are put under stretch. For a permanent effect some mechanical means of holding these ribs depressed and preventing the recrudescence of the thoracic activity must be employed. Such method may be adopted alone or to assist voluntary efforts temporarily or permanently. I prefer the method of education rather than such mechanical assistance, but find mechanical assistance mentioned below essential in certain instances.

Another example of the value of forcing the diaphragm to work by restricting the expansion of the chest is seen in persistent basal bronchitis. I believe that a number of these cases persist because contraction of the dome of the diaphragm is insufficient to promote expansion of the lower lobes, and thus to get sufficient air behind the mucus to dispel it.

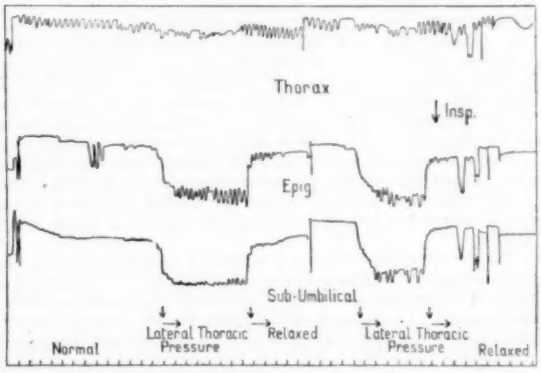
Fig. 5 shows the diminution in the quantity of sputum as the result of lower thoracic constriction. This patient had had bronchitis for several weeks; he was admitted under my care, and as he had run the gamut of the usual expectorants was given an iron tonic. This produced no amelioration. The quantity of his sputum was measured, and a piece of strapping applied so as to constrict the lower thorax. It was changed once to promote further constriction, and the slide shows a fall of temperature and the diminution of sputum which rapidly accompanied this treatment. This mode of treatment is also useful in some cases of more chronic bronchitis.

As an example of this, I may quote the case of a retired army officer, aged 62, who, following influenza three years previously, had been expectorating about a coffee-cup full of sputum daily in spite of going abroad during two winters. The sputum showed a pure infection of *B. influenzæ*. His type of breathing was rather markedly thoracic. In ten days after lower thoracic restriction he had ceased to expectorate and his dyspnœa on exertion was much improved. In the last 18 months he has not relapsed and wears the apparatus night and day.

This is a useful method, both in adults and in children: for the latter a skein of wool may be employed.

2. *To Relieve Stress on Muscle.*—Under the second heading the effect of relief to the overtaxed muscle is striking in cases of pleurisy, but is valuable in other types of tonic muscles. The old method of applying strapping seems largely to have fallen into abeyance, the reason for which is, I think, that any complete constriction of the chest is intolerable. When applying strapping to a chest, and to be effective it has to be applied round the whole chest, the first thing that

FIG. 4.

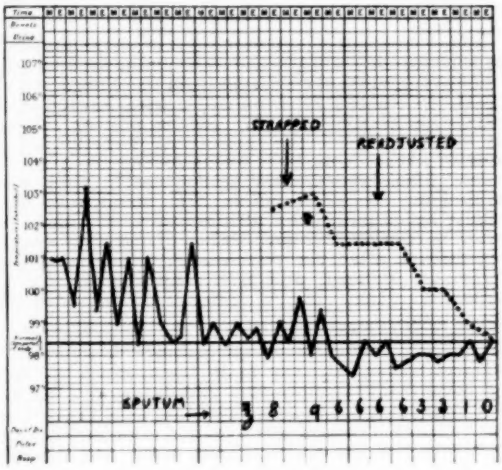


Effect of compressing lower thorax (*a*) on the upper thorax, diminished movement, and (*b*) on the diaphragm, elevation of level of the abdomen and increased movement. Functional case.

patients do is to try to take a deep breath, and when this is found to be impossible they become alarmed, and say they are being choked or strangled, and insist on being set free. To obviate this I now use in all adult cases where restriction is employed a piece of webbing in the form of a belt, in the course of which is inserted a spring. The objection is removed, for the patient can take a deep breath, and therefore does not experience those uncomfortable and terrifying sensations. The permanent effect is, however, the same, and when the effort ceases the chest is restored to the required dimensions. This belt also is of advantage because it can be readily varied, whereas strapping adjusted remains in position, and, further, tends to stretch a small amount, and therefore the constriction does not remain constant or as originally desired.

When applied in a case of pleurisy the spring is placed on the sound side. On the affected side the belt should pass over the area where the intercostal muscle is most sensitive. Its effect, when suitably adjusted, is to cause cessation of the spasm in the muscles controlling the ribs in the affected area. This is immediate, and should be the criterion as to adjustment. The persistent pain (but not that on coughing) begins to diminish forthwith, and has usually disappeared within ten minutes to half an hour. I believe that this is an additional proof of my thesis that the pain is produced by a tonic contraction of the muscle. Not only the intercostal, but the other muscles, such as the triangularis sterni and transversalis, cease to be tender, and the referred pain disappears. At the same time the frictions are heard more distinctly. This is explained by the fact that epigastric protrusion is induced or increased showing greater movement by the diaphragm. The fact that this epigastric protrusion is induced when previously it was absent is strong evidence that pleurisy per se does not cause complete inhibition of the diaphragm. I gave a full explanation in my second lecture. It is a further advantage that, if desired, either a poultice or ice can be applied over the webbing of the belt.

FIG. 5.



Showing diminution in quantity of sputum as the result of lower thoracic constriction.

Short of relieving the action of the muscle by the means indicated above, I feel sure that heat is the best local application whether by poultices, hot-water bottles, diathermy, or heating of dinner plates and holding them to the affected area, as was the habit of a patient with retrosternal pain prior to trying strapping.

The triangularis sterni has been mentioned before as being particularly liable to become tender, and pressure upon it produces pain in the lower sternal region, which is frequently recognised by the patient. Assisting the action of the muscle is a rational method of treatment. The part of the muscle which can be palpated is attached to the xiphisternum mesially, and to the back of the sixth rib laterally. I propose to mention four types of case in which such a mechanism as a spring belt gives great relief.

The first is the patient who wakes at night with retrosternal pain in the referred area of this muscle. Whether this muscle is overtaxed as the result of a dream, or getting too low in the bed so that the spine is extended, I do not know. However, the application of this belt at the level of the lower end of the sternum and xiphisternum relieves the pain at once, and these individuals do not forget to place the belt under the pillow on going to bed. The second type is found in cases of severe colds with mild bronchitis of the larger tubes where low sternal pain develops. Assisting the muscle relieves this pain. The third type is caused by injury.

As an instance of this, I quote the case of a motor-lorry driver who, while starting his engine, suddenly felt something snap in his chest. Pain developed instantly, of such severity that he could not move and believed that he was dying. He was taken home and diagnosed as angina pectoris. The diagnosis was, however, clear when bruise discoloration appeared in the fourth intercostal space. Constriction at this level relieved him at once. This accident is becoming more frequent.

The fourth type is well represented by the case of a doctor, aged 60, who developed pain if he walked 100 yards, and was advised to give up work on account of coronary artery sclerosis diagnosed from this retrosternal pain on exertion. He has been wearing one of these belts for seven years, and now only occasionally gets pain, and carries on a big practice, largely on foot.

This method of restriction of the lower part of the chest will frequently also relieve pains arising from the upper part of the chest, and I believe it does so by inhibiting thoracic and promoting diaphragmatic expansion, and so diminishing the necessity for excessive thoracic respiration. For instance, in a case of tenderness arising from a tonic condition of the scalene,* promotion of abdominal respiration will relieve that tonic condition; at the same time it will cause the muscle to contract actively and so elevate the chest during inspiration.* At first sight it appears to be a paradox that increasing the contraction of the muscle should relieve pain, but again I believe this supports the theory I have put forward that it is the tonic contraction without relaxation of muscle and not the intermittent active contraction which is the cause of the pain.

There is a certain type of case which develops pain on exertion in the chest, neck or arm, in whom the heart is apparently sound. The pains last for 18 months or two years, and then cease. They may accompany the commencement of rise of blood pressure. These are individuals who were mainly thoracic in type, and in the course of time are turning to diaphragmatic breathing. They are usually between 50 and 60 years of age, a period during which many degenerative changes are taking place, one of importance being the onset of calcification of costal cartilages. These are relieved by thoracic constriction* which has to be continued for 18 months to two years, and then with the disappearance of pain can be discarded.

Posture.

I have mentioned posture on hands and knees as a means to be adopted in children of promoting diaphragmatic contraction. The converse occurs on extension of the spine which promotes thoracic movement. In children of poor thoracic development who elevate the thorax in inspiration but do not contract the intercostal muscles, considerable improvement follows the adoption of a posture in which the thoracic spine is fully or over-extended for an hour twice a day. It is most efficacious in those between 6 and 10 years of age.

After pleurisy when the intercostal muscles on one side remain contracted, and there is a tendency to the production of a lateral spinal curvature, some considerable amelioration can be produced by making the individual lie on the sound side, the spine extended, and with a pillow or sandbag under the lower side. This causes the upper (the affected side) to become convex, to open the intercostal spaces, and promotes contraction. It may be painful for the first few efforts, but should be persisted in.

CONCLUSION.

In conclusion, the negative result of a search of the literature has made me conclude that the mechanical side of respiration has not received the

attention it deserves. Investigations during the last half century have been concerned rather with what may be called the chemical side. Recent advances in our knowledge of the muscle reaction to stretch and postural tone have introduced new conceptions, some of which I have attempted to apply to the muscles concerned in respiration.

By adopting the orthograde position man has, to some extent, altered the mode of action of his respiratory muscles. In animals the mechanical act of respiration is carried out almost entirely by the diaphragm, the bony thorax being more concerned with the support of the weight of the body and forming a case for the lungs than with expansion of the latter. In man, though the diaphragm remains the chief agent, the thorax is freed from its weight-supporting function and helps expansion.

Under certain circumstances which I have described, too great a part of the work of expanding the lungs is transferred to the thorax. This involves abnormal work by some of the thoracic muscles, a response which is ontogenetically unnatural to them and which qua muscle circulation and general energy is uneconomical. Within limits they function without complaint, but with greater stimuli they are driven into conditions of persistent and excessive tonus. These unnatural actions acquired comparatively recently cause symptoms, thus following the usual law. Their protest takes the form of pain and distress. These symptoms can be relieved by the removal of the source of the stimulus, or by relieving the stress on the muscle by mechanical means.

Considering the general importance of the orthograde habit as an original cause of these troubles, and the influence of increased emotional development, we are forced to conclude that to a large extent these symptoms are among the penalties man pays for his advances over the lower animals.

I have to acknowledge my indebtedness to Dr. Wiltshire for helping me compose these lectures, and to the Medical Research Council for a grant in 1919 towards the recording apparatus.

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MENORRHAGIA AS A SYMPTOM OF MYXŒDEMA.

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THE frequency of menorrhagia as a symptom of myxœdema is now quite generally recognised by those who have studied myxœdema from the clinical aspect, but it has scarcely received sufficient attention in the text-books of gynæcology. In the present instance we have analysed the menstrual histories of 59 cases of myxœdema seen by us during the past five years. The results show quite clearly that when myxœdema develops before the menopause it is usually accompanied by menorrhagia. On the other hand, a considerable proportion of patients develop this disease after the menopause, either natural or artificially induced, and this may account for the impression that it is often accompanied by amenorrhœa.

Summary of the Literature.

The following are the main facts which we have extracted from the literature bearing on this subject. Most text-books of gynæcology state that myxœdema is accompanied by amenorrhœa, but Eden and Lockyer (1920) discuss the subject more fully and conclude that in the present state of our knowledge the relation of thyroid activity to uterine hæmorrhage cannot be defined. They point out that menorrhagia, without a recognisable local cause, is sometimes seen in women suffering from myxœdema, but that amenorrhœa is also found. The occurrence of menorrhagia in myxœdema was first reported in 1893 by three separate observers, Allen Starr, Kirk, and Schotten, quoted by Meyers and Falta. Later Murray (1908) pointed out that although menorrhagia occurred during the early stages of myxœdema in some cases, amenorrhœa was more commonly found. Sehrt (1913), quoted by Novak, reported a series of 55 cases of functional hæmorrhage. In 38 of these cases there were definite indications of hypothyroidism. Hertoge (1915) suggested that the profuse menstruation of thyroid-deficient women was due to infiltration of the uterine muscle and mucosa and to diminished coagulability of the blood. He also pointed out that the higher the degree of thyroid defect the greater was the menstrual loss. McCarrison (1918) was also of the opinion that menorrhagia is a sign of thyroid deficiency, and that it is the rule when thyroid defect arises in later life, the menstrual period being prolonged and the intervening time shortened. Finally, Israel Bram (1924), in his book on goitre, summed up the existing evidence and gave it as his opinion that though menstruation in thyroid deficiency is often regular in rhythm, it is usually excessive and characterised by menorrhagia. The association of menorrhagia with thyroid deficiency has, therefore, been frequently described.

Cases occurring before Natural Menopause.

Table I. shows a series of 23 cases in whom myxœdema developed before the natural menopause. The average age of the menopause in women in this country is, of course, variable, but it is generally taken as occurring between the ages of 45 and 52. In half the cases of this group the patients had not reached the menopause when seen by us for the first time. In the remainder the history showed that the menopause had occurred at the average age (the average for the 11 cases was 48¼), and had been preceded by menorrhagia, generally of two or three years' duration. The basal metabolic rate was estimated in the majority of these patients, and in all those so examined it was considerably below the

normal and characteristic of myxœdema. In Case 12, where the basal metabolic rate was only −3 per cent., it is to be noted that the patient was actually receiving thyroid extract when the estimation was carried out. A study of the table shows that no less than 18 of these cases suffered from menorrhagia as a symptom after the onset of myxœdema. In only four was

TABLE I.—*Myxœdema Developing before Natural Menopause.*

Case.	Age.	Basal metabolic rate (per cent.).	Menstruation since myxœdema.	Natural menopause at—
1	48	−35	Menorrhagia	Not reached.
2	39	−27·7	,,	,,
3	44	−30	,,	,,
4	49	−16·7	Normal	,,
5	48	−16	Menorrhagia	47 years
6	40	−37·5	,,	Not reached
7	40	−21·1	Normal	,,
8	49	−30	Menorrhagia	47 years
9	53	−22·8	,,	45 ,,
10	53	−16	,,	48 ,,
11	34	−40·8	Normal	Not reached
12	50	− 3·3*	Menorrhagia	45 years
13	58	−16	,,	51 ,,
14	59	—	,,	50 ,,
15	53	−21	,,	51 ,,
16	43	—	,,	Not reached
17	40	− 5	Normal	,,
18	56	−40	Menorrhagia	48 years
19	59	—	,,	45 ,,
20	60	—	,,	55 ,,
21	48	—	,,	Not reached
22	48	−26·6	,,	,,
23	36	−29·3	Delayed, irregular and scanty	,,

* On thyroid.

menstruation regular and normal and in one instance a tendency to amenorrhœa was found. In this series, therefore, 78 per cent. of the patients in whom myxœdema developed before the natural menopause suffered from menorrhagia.

Cases occurring after Natural Menopause.

Table II. shows a series of 15 cases of myxœdema developing after the natural menopause. The average age of the menopause in this group was 49½, and menstruation in all cases had previously been normal. The average period of time between the cessation of

TABLE II.—*Myxœdema Developing after Natural Menopause.*

Case.	Age.	Basal metabolic rate (per cent.).	Menstruation before menopause.	Menopause.	
				Years previously—	At—
1	51	—	Regular and normal	4	47
2	56	−53·7		3	53
3	59	—		7	52
4	75	−21·8		25	50
5	56	−22·9		6	50
6	49	−26·7		2	47
7	51	−26·3		4	47
8	50	—		3	47
9	67	—		15	52
10	50	−15		3	47
11	60	−14·3		8	52
12	56	−11		6	50
13	70	−42		20	50
14	55	—		9	46
15	60	−35		10	50

menstruation and the date at which these patients reported for treatment for myxœdema was 8½ years, an interval which seems sufficient to justify the assertion that, in this series at any rate, the onset of myxœdema was not the cause of amenorrhœa; rather does it confirm the opinion which has frequently been expressed that myxœdema is a disease which tends to develop after the menopause and normal ovarian activity has ceased.

Taking into consideration, therefore, the 38 cases already quoted in Tables I. and II., it appears that myxœdema develops before the natural menopause in rather less than two-thirds, and in the majority of these patients (78 per cent.) it is accompanied by menorrhagia. In the remainder, rather more than one-third, myxœdema develops after the natural menopause, and in this group menstruation previous to the menopause was quite normal.

Cases Occurring after Premature Menopause.

Table III. shows a series of three cases which cannot be grouped either in Table I. or Table II., owing to the fact that the menopause occurred prematurely. The cases were all quite typical of myxœdema, and the basal metabolic rate was subnormal in all three, −35 per cent., −20·3 per cent., and −28 per cent. respectively. The onset of the disease, however, did not occur for many years after the menopause. In Case 1 the interval between the cessation of menstruation and the onset of symptoms of myxœdema was eight years, in Case 2, 12½ years, and in Case 3, 18½ years, so that here again it is extremely unlikely that the cessation of menstruation was in any way due to the thyroid disturbance which developed subsequently. In Case 3 the symptoms of myxœdema were first noticed 18 months after the removal of a retrosternal goitre. The goitre had been present for four years before operation was undertaken, so that the interval

TABLE III.—*Myxœdema Developing after Premature Menopause.*

Case.	Age.	Basal metabolic rate (per cent.).	Menstruation before menopause.	Menopause.		Myxœdema for—
				Years previously—	At—	
1	45	−35	Regular	11*	34	3 years.
2	52	−20·3	,,	14†	38	15 months.
3	60	−28	,,	20	40	18 months‡

* Following stroke.
† Following pregnancy (one period after and then stopped).
‡ Following thyroidectomy performed for retrosternal goitre which she had had for four years.

between the menopause and the onset of thyroid symptoms in this case was 14½ years. The cause of the premature menopause in Case 3 was not discoverable, but in Case 1 it occurred after a stroke, and in Case 2 after pregnancy, menstruation appearing on one occasion only after the child had been born.

Cases Occurring after Artificial Menopause.

Table IV. shows a series of 15 cases in whom the artificial menopause had been induced either by surgical measures or X rays for menorrhagia. All these patients have since developed typical symptoms of myxœdema and are now under treatment with thyroid extract. The question that arises is whether the menorrhagia in these patients was an early symptom of myxœdema. Unfortunately, it is impossible to speak with any certainty as to the state of the pelvic organs at operation in all these patients, as gynæcological treatment in the majority was undertaken some years ago and not at this hospital. Consequently, we have not been able to obtain detailed information as to the operative findings. But in none of the 15 cases was there any history of operation having been undertaken for the removal of fibroids or other organic disease of the pelvic organs. The story which we obtained was more or less the same in all cases. The patients had complained of menorrhagia for varying periods, and had had the usual treatment with ergot mixtures, iron tonics, and rest in bed. None of them had had thyroid extract. When the condition did not respond to any of these measures, operation was advised as affording the only means of relief. We have also added to this table three cases in whom an organic pelvic lesion, ovarian cyst or fibroid or both, was known to have been present. All three patients were operated upon, and the typical symptoms of myxœdema have since developed.

TABLE IV.—*Myxœdema Developing after Artificial Menopause.*

Case.	Present age.	Type of operation.	Age at operation.	Operation for—	Alteration in weight since operation.	Present condition—B.M.R. or sugar tolerance.
1	47	Double ovariotomy; hysterectomy.	42	Menorrhagia for three years.	+1 st. 11 lb.	Typical myxœdema.
2	58	Hysterectomy.	47	Menorrhagia for two years.	−2 st.	B.M.R.−16 per cent.
3	50	Double ovariotomy.	23	Menorrhagia.	Obesity + +.	B.M.R.−3 per cent.; taking thyroid.
4	52	Hysterectomy.	45	Floodings for four years.	+3 st.	B.M.R.−19·4 per cent.
5	50	Double ovariotomy; hysterectomy.	47	Menorrhagia for five years.	Obesity +.	Sugar tolerance decreased
6	53	Hysterectomy.	49	Floodings for nine years.	+1 st. 7 lb.	Sugar tolerance decreased; goitre present.
7	39	Double ovariotomy; hysterectomy.	34	Floodings.	—	B.M.R.−27·7 per cent.; sugar tolerance decreased.
8	53	Hysterectomy. Hemithyroidectomy.	47 38	Menorrhagia.	—	B.M.R.−16·6 per cent.
9	56	Sterilisation by X ray.	?	,,	—	B.M.R.−40 per cent.
10	59	Hysterectomy.	40	,,	Obesity + +.	Typical myxœdema.
11	57	Double ovariotomy.	44	Floodings.	+2 st. 3 lb.	,, ,,
12	27	,, ,,	26	Menorrhagia.	+3 st. 2 lb.	,, ,,
13	52	Double ovariotomy; hysterectomy.	48	,,	+1 st.	,, ,,
14	41	Double ovariotomy; hysterectomy.	38	,,	?	Myxœdema with goitre since operation.
15	33	Hysterectomy.	33	,,	?	Goitre B.M.R.−24·4 per cent.; sugar tolerance decreased.
16*	41	Double ovariotomy (ovarian cyst).	33	,,	+2 st. 7 lb.	Typical myxœdema.
17*	53	Ovariotomy; hysterectomy (for cystic ovary + fibroid).	50	Floodings.	+½ st.	B.M.R.−21·1 per cent.; sugar tolerance decreased.
18*	57	Double ovariotomy; hysterectomy (fibroid).	50	,,	+2 st. 4 lb.	Typical myxœdema.

* With additional ovarian cyst or fibroid.

In the majority of the patients of this group the basal metabolic rate was estimated and found to be considerably below the normal. The results are given in Table IV. In the others this examination could not be made, but the typical symptoms of myxœdema were present in all. Four of the patients showed the typical decrease in sugar tolerance which we, in association with P. C. Brett, have already reported as a characteristic change in myxœdema. Taking into consideration the facts which we have already quoted in Table I., it has seemed probable to us that in some of the patients of this group (Table IV.) at any rate the menorrhagia which occurred before operation was an early symptom of myxœdema. This suggestion is supported to some extent by the subsequent development of characteristic symptoms of myxœdema in all. In the absence, however, of more accurate information as to the condition of these patients before operation, this view can only be regarded as hypothetical. Nevertheless, the cases reported in Table I. do show that in this series a very definite proportion of women suffering with menorrhagia are the subjects of some degree of hypothyroidism. And what we particularly wish to emphasise as a result of these observations is that where pelvic examination reveals no abnormality, the possibility of thyroid deficiency should always be raised. Investigation of the basal metabolic rate is useful in this connexion.

Summary and Conclusion.

As a result of the analysis of the menstrual history of 59 cases of myxœdema the following conclusions have been reached: (1) In our series of cases myxœdema developed before the natural menopause in 56 per cent. and after the menopause in 44 per cent. (2) When myxœdema developed before the natural menopause, menorrhagia was present in 78 per cent. of cases. (3) Myxœdema is a common sequel to the artificial menopause when the latter has been induced for menorrhagia without apparent local cause. Fifteen cases have been quoted in this paper. The probability is that the menorrhagia, in some of these patients at any rate, was an early symptom of myxœdema.

In conclusion, we wish to express our thanks for the help which Prof. H. MacLean has extended to us, and to the Medical Research Council for defraying expenses for this investigation.

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THE POSSIBILITIES OF OPERATION IN INFANTILE PARALYSIS.

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CASES of infantile paralysis are not of everyday occurrence in general practice, and it would be unreasonable to expect the average family doctor to possess a full and critical knowledge of all the operations that have been devised for the relief of this condition. But it is most emphatically the duty of every practitioner to know what can and cannot be achieved by various methods of treatment, and especially by operative treatment, so that his patients may not endure any unnecessary suffering. In other words, he should know enough about present-day practice in the treatment of infantile paralysis to be able to give his patient the benefit of the most modern forms of treatment. Furthermore, he must be sufficiently skilled in the management of the case in its non-operative stage, to prevent any avoidable increase of disability; in particular he must not allow any contracture of the paralysed limbs and must avoid any increase of the existing paralysis from over-stretching of the paralysed muscles. The main object of this paper is to indicate what expert orthopædic surgery can offer for the relief of certain types of paralytic cases and to avoid details of interest only to the actual operator.

Indications for Treatment at Various Stages.

At a very early stage of the disease—that is to say, within the first few weeks of the recognition of the attack—the most important indication by far is to place the paralysed muscles at complete rest. Further, they must be rested in a position of complete relaxation. The most effective splint for this purpose is a plaster bed, which consists, really, of a suitably-padded plaster case in which the patient lies completely immobilised. This not only affords the best possible prospect of recovery of function in the injured muscles, but also minimises the pain which is not infrequently quite considerable at this stage.

Complete physiological rest of the affected muscles is at this stage incomparably more valuable than massage, movements, or electricity. Indeed, it is generally unwise to employ these measures at this stage. Even at a later date, electricity is far less valuable than is often imagined. If it were necessary to choose between efficient splintage and electricity, the choice should undoubtedly fall in all cases upon splints. Electricity is at best but a poor substitute for the natural stimulation of the paralysed muscles and the greatest care and skill must be employed in its application; in particular, care must be taken that only the paralysed muscles are stimulated to contract and that the current does not overflow into the opposing and probably normal muscles, or else the effect produced will be the exact opposite of that which is desired—viz., the opposing muscles will be strengthened, whilst the paralysed muscles will be still further weakened by the strain to which they are subjected. Again, care has to be taken not to make the weakened muscles work against an over-great resistance lest they should be exhausted, and they must not be exercised to the point of fatigue; the object is to strengthen them and not to weary them. It is unwise, in my experience, to prolong the systematic use of electricity for more than a year. As a rule young patients become rather current-shy by the end of this time and a certain amount of voluntary power will then have returned in muscles destined to recover; on the other hand, if the muscles are not going to recover, no good will come from further prolongation of the electrical treatment. As soon as a certain amount of voluntary power has returned in the paralysed muscles, voluntary movements performed by the patient himself, manually assisted if necessary, will be quite as effective as electrical stimulation and probably better.

The gist of this is that electrical stimulation is a valuable aid at a certain stage and so long as it is suitably carried out; but it is always to be regarded as an adjunct to treatment. The promiscuous use of a faradic battery by ignorant parents and others is to be whole-heartedly condemned.

Cause of Contractures.

The contractures that take place in infantile paralysis are due to two causes—viz., the unbalanced action of the muscles and the effect of gravity. For example, if the extensor muscles on the front of the leg are paralysed and the calf muscles are not, the latter muscles will pull the heel up and the foot down, and the deformity known as talipes equinus will result. Gravity aids in the production of this deformity, because the natural tendency of the foot, if unsupported by the extensor muscles, is to drop down by its own weight. It is of prime importance to prevent this equinus developing, not only because it renders walking difficult, and a subsequent tenotomy for its relief necessary, but also because it takes away practically all hope of recovery in the damaged extensor muscles.

I cannot emphasise too strongly the importance of always protecting the paralysed muscles from over-stretching, which is the first and most fundamental law of successful treatment. If it were only appreciated more widely, the sum total disability from infantile paralysis would be approximately halved. It is still quite a common experience to see children in orthopædic clinics who have been treated with electricity and perhaps massage for several years, but have never had a splint applied from the very onset of their disease. In infants, and in quite early stages of paralysis in older children, night-splints only will be needed, but when the power of walking begins to return it will probably be necessary to provide a day-splint as well, designed to assist the action of the weakened muscles. Incidentally, it may be remarked that the most striking deformities are produced when certain muscle-groups are only affected; if one muscle pulls and its opponent does not pull, the foot will obviously be dragged out of its normal position, whereas if all the muscles of a limb are more or less equally paralysed no gross deformity will ensue, though the limb may be practically flail.

Indications for Operation.

In considering the advisability of operation one of the first questions will be: At what age should it be undertaken? Much depends, of course, upon the nature of the operation that is contemplated, but it may be stated as a generalisation that it is unwise to perform any sort of operation within about three years of the onset of the attack. Usually, if treatment has been adequate in the meantime, no operation is necessary at such an early date, but the main point is that recovery may still take place, in greater or less degree, within this period; generally, of course, the greatest amount of recovery takes place in the early months following the onset, but it goes on more slowly for many months afterwards, and in some cases seems to appear quite unexpectedly after months of apparent failure of response to treatment. It can hardly be said, therefore, within three years of the onset, what the ultimate paralysis is going to be, and many surgeons would defer the decision until five years or even later. The only operation that should be performed, in my opinion, within this period, is simple tenotomy—usually tenotomy of the tendo Achillis. In cases in which a proper rectangular night-splint has not been applied, an equinus deformity may appear, and this renders walking very difficult and greatly decreases the prospect of recovery of the affected extensor muscles; in such cases the calf-muscles soon undergo contracture, and when this has occurred it is unsatisfactory to attempt to stretch them again by splintage, and the most practical way of treating the condition is to perform tenotomy of the tendo Achillis. In several of these cases, in which there has not been the least response to efficient treatment whilst the equinus persisted, I have obtained practically complete recovery after relaxing the extensor muscles by performing tenotomy.

At a later stage the question of an operation may be considered from various points of view: (1) We can never create power, for those muscle-fibres that have been destroyed by the disease are permanently destroyed, and the utmost that conservative treatment can achieve is the development of the fibres that remain. Such power as is gone is gone for ever. But where the damage has been unbalanced in its distribution we can sometimes redistribute the power, with resulting improvement in function. (2) If the muscles controlling a joint have been so extensively damaged that the joint is practically "flail," that joint becomes a hindrance instead of a help, and the patient would be better without it. (3) An operation may enable the patient to dispense with the use of apparatus, or at any rate to get along with an instrument which is cheaper, less cumbrous, and less expensive than formerly. (4) In neglected cases considerable contractures often appear and serious mechanical disability is then invariably added to that which results from the paralysis per se. A judicious correction of the mechanical disability by division of contracted muscles, ligaments, joint capsules, &c., will then substantially improve function. We will consider each of these headings in turn.

Tendon Transplantation.

If one important muscle is seriously paralysed, and another good muscle of similar action is available and can be spared from its present position and function, its tendon may be detached from its present insertion and transferred to that of the paralysed muscle. This is the fundamental principle of tendon

FIG. 1.

A B

A, Paralytic talipes calcaneo-valgus. Gastrocnemii and soleus seen, at operation, to be totally destroyed.

B, Result of tendon-transplantation.

transplantation. Generally speaking, it may be taken as axiomatic that the tendon to be transplanted should be that of a muscle of homologous group—that is to say, that a flexor tendon should be transplanted into a flexor and an extensor into an extensor, and not vice versa. Further, the surgeon has to beware of the obvious fallacy of "robbing Peter to pay Paul"; a tendon must only be transplanted if its function can be substituted, in greater or less degree, by some means or other, and if it is going to subserve a more important function in its new position than it did in its normal one. Lastly, it is obviously useless to transplant a tendon unless the muscle belonging to it is of adequate power; if it cannot do its work efficiently in its new position it is much better to treat the case by instruments or some other means. For example, if all the muscles of a leg have suffered severely and none of them retain much power, it is not much good to perform transplantation, even though one group be rather more powerful than another which it is desired to reinforce. It must be borne in mind, too, that it is not enough for a transplant to be capable of effecting a certain movement of a bare foot resting upon a pillow. What it has to do is to effect the movement when the limb is carrying the body-weight, which is a very different proposition, and in many instances it is a question of carrying, not only the body-weight, but also the weight of a high boot, which may be considerable. I can recall several cases where this important practical point was overlooked and a tendon-transplantation which looked perfectly satisfactory when the patient lay in bed was found to be perfectly unsatisfactory in practice.

The ideal case, then, for tendon-transplantation is that in which one important muscle-group is severely paralysed, a fair amount of power remaining in the limb generally, and another sufficiently homologous muscle is available for the substitution of the damaged one.

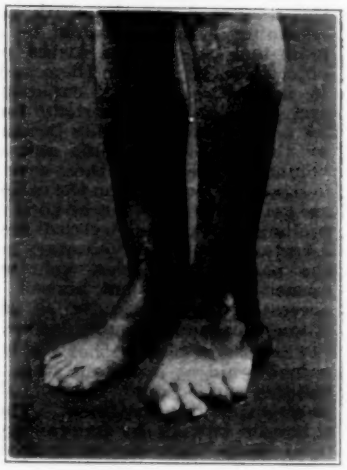
Two good examples of helpful tendon transplantation are (*a*) the substitution of a paralysed calf-muscle by the use of the peronei and toe-flexors. Fig. 1 shows a patient in whom the calf-muscles were found at operation to be totally destroyed, consisting of a mere tissue of white fat and fibrous material; tendon transplantation was performed and the second photograph shows the result. The patient was able to walk about, run, and stand on tip-toe without instrumental assistance. (*b*) The substitution of paralysed tibiales (which results in the production of a very disabling paralytic valgus) by the use of both long extensors of the toes; it is true that a certain amount of power of extension of the ankle-joint is lost by this means, but it is not entirely lost and extension of the toes can still be performed by the extensor brevis. If a choice has to be made of the lesser of two evils, it is found in practice to be far better to sacrifice a slight amount of extension in order to be cured of a painful and unsightly valgus.

One of the most successful of the simpler transplants is that of the tibialis anticus to the outer border of the foot for the relief of peroneal paralysis; this operation is valuable in Friedreich's paralysis and various other nerve lesions, as well as in infantile paralysis. (Fig. 2.)

Many other examples of tendon-transplantation might be given, but the above will suffice to illustrate its usefulness. (Fig. 3.)

One particular transplantation may be mentioned, however, because, though it seems to be opposed to theoretical principles, it nevertheless gives satisfactory results. This is the transplantation of the biceps cruris to assist the action of a weakened quadriceps. This is an example of a heterotype transplantation—that is to say, it consists in the substitution of an extensor by a flexor muscle. But in some cases in which the quadriceps is just too weak for its work, and there is a slight amount of instability of the knee, it is found that the reinforcement of the quadriceps by carrying forward the biceps muscle and tendon gives just that slight increase in power which is sufficient to stabilise the joint. In suitably selected cases this operation may enable the patient to dispense with an unsightly and expensive splint, reaching to the groin, or, in hospital cases, to get rid of an awkward calliper splint.

FIG. 2.



Tibialis anticus transplanted to outer side of foot. (Useful in many forms of talipes varus; one of the most efficient of transplantations.) The case shown is one of Friedreich's disease.

Stabilisation Operations.

When a joint is wholly uncontrollable it is clearly a nuisance. It can be stabilised in one of two ways—viz., either (*a*) by the use of an instrument furnished with a hinge which can be locked at will, or (*b*) by removing the articular cartilages by operation and producing a bony ankylosis instead of a joint. This type of operation is known as an arthrodesis. In many cases of infantile paralysis it is very valuable. For example, in the case of a flail foot there are quite a number of uncontrollable joints—viz., the ankle-joint, the subastragaloid joint, and the mediotarsal joint. To control such a flail foot it is necessary for the patient permanently to wear an instrument consisting of double steels reaching to the knee or else to have the joints fixed by operation. This results in rather a "clumping" walk, but many patients much prefer this to the permanent wearing of a heavy, clumsy, expensive, and unsightly apparatus. A flail knee, also, can easily be stabilised by the performance of arthrodesis, but it is a debatable question whether this operation is preferable to the use of a knee-cage, for though an arthrodesis may deliver the patient from the wearing of an apparatus, it leaves him with a very awkward limb which gets greatly in the way in public

vehicles, and so on. Many surgeons, therefore, think that it is better to provide a hinged instrument which can be locked at will.

The shoulder, however, when paralysed, provides an ideal opportunity for the performance of arthrodesis. As a rule, when the deltoid is paralysed the rest of the limb is fairly serviceable, but as the shoulder-joint forms a loose and uncontrollable link between the upper extremity and the trunk, the arm, though it may be perfectly good in itself, is rendered

FIG. 3 A.

FIG. 3 B.

Another tendon-transplantation, before and after operation.
Before operation. After operation.

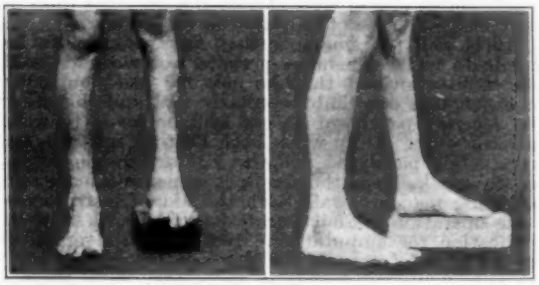
functionally useless. By ankylosing the arm at right angles to the glenoid cavity an enormous improvement is immediately obtained, for the patient is able to move the upper limb with the scapula to quite a useful extent by means of the scapular muscles.

In the case of flail foot and of feet which are too severely paralysed to be amenable to treatment by means of tendon-transplantation, arthrodesis is now becoming largely replaced by the more modern stabilisation operations. For the most part these consist in a combination of partial arthrodesis with mechanical rearrangement of the foot so as to render it a firmer basis upon which to balance the body-weight when walking. For instance, the fore-part of the foot may be shortened by removing bone, so that the anterior pillar and the posterior pillar, as seen from the side, are more nearly equal in length and approximate more closely the form of an equilateral triangle. A common method nowadays is to ankylose the subastragaloid and the mediotarsal joints and to leave the ankle-joint untouched. Even though the muscles of the leg be completely paralysed it is still possible for the patient to balance upon the ankle-joint, much as a person balances on the ankle-joint of an artificial limb; and this method gives a much more elegant gait than does the older operation of panarthrodesis. The operation which I prefer to all others for the stabilisation of a flail foot or a much paralysed foot consists in a combination of the methods introduced by Naughton Dunn and Hoke. By this method a stable foot can be produced in practically any case of advanced paralysis of the muscles of the leg and with simultaneous rectification of any gross deformity that may have crept in in the course of years. Of course, if shortening is present, that persists, but patients always regard it as the greatest boon to be able to get rid of their leg-irons and to have to wear only a high boot or shoe, which, indeed, may hardly attract attention if the shortening be moderate and capable of being compensated by a cork inlay inside the footwear.

Even in cases where there is considerable paralysis of the thigh, in addition to a flail foot, it is still worth while to perform a stabilisation operation for the flail foot, because this rids the patient of the preponderating factor in the instability of his limb, and his gait becomes proportionately improved; further, he can often use a light knee-cage instead of a heavy double instrument reaching from the ground to the thigh, and in any case the cure of the drop-foot usually results in a great saving of expense in respect of surgical boots. Fig. 4 shows a very interesting case of infantile paralysis treated by arthrodesis.

Arthrodesis and stabilisation operations depend for their success upon sound bony fusion between the bared bone surfaces, and are, therefore, best performed when the tarsal bones are fairly well ossified; they can be carried out successfully at 9 years, but it is better, whenever possible, to postpone the operation until a few years later. In other words, cases of flail foot and severely paralysed foot are best treated by instruments, as a rule, until they are 10 to 12 years of age, when a Dunn-Hoke or some similar operation can be carried out with very great advantage. These patients appreciate enormously the knowledge that when once this operation has been carried out their foot has been stabilised once for all and that it can never get out of shape again, and that they have henceforward only to concern themselves from time to time with the provision of a new boot with a concealed inlay. Knowing that they will not be liable for the future to have to enter hospital again from time to time, and that if they get a wage-earning post they will be able to keep it, these patients find their outlook on life wholly altered and they gladly seek remunerative occupations.

FIG. 4.



A stabilisation operation.

Myotomies and Capsulotomies.

In neglected cases, when the proper use of splints has been lacking, contractures often occur, and a considerable mechanical disability is added to that which has already been produced by the paralysis itself. For example, if a calliper is outgrown the knee will flex and this will result, secondarily, in a flexion at the hip-joint in order to maintain the erect attitude. In some cases it is even found that patients have been kept in bed for unnecessarily long periods and the use

of pillows beneath the knees and behind the shoulders has resulted in the production of flexion at both these joints. All the structures upon the concavity of the joint become contractured, not only the muscles. The latter can be easily stretched by means of weight extensions, but joint-capsules are made of very tough white fibrous tissue and are very resistant to the stretching process and very liable to relapse as soon as the weight is removed. A much more rapid and much more workmanlike method than stretching is the open division of all the resisting structures, including the joint-capsule. This method, not being prone to relapse, is to be preferred in all cases, and especially in those cases of relapse due to parental neglect, since the result is much more likely to be permanent than is the result of temporary weight-extension. The method is particularly applicable in the case of contracture at the knee, but can also be applied in the case of other joints—e.g., the hip and the elbow. At the hip it is usually necessary to divide all the muscles upon the front of the hip-joint and the anterior part of the capsule of the hip-joint itself, avoiding only the anterior crural nerve and the great vessels. In cases of extreme deformity it is often necessary to correct the faulty position of the limb by stages. It is easy to obtain sufficient lengthening of the muscles, ligaments, and joint-capsule at one sitting, but there would be danger to the nerve-supply and circulation of the limb if the contracture were corrected at once; it may be necessary, therefore, after division of all possible structures, to bring the limb down to a certain extent only and to fix it there in plaster for a few weeks before undertaking a further correction. By proceeding in this way even the severest cases of neglected deformities can, as a rule, be remedied, including those distressing examples of four-footed progression.

Amputation.

Amputation is very seldom required nowadays in infantile paralysis. The fact that a whole limb is totally flail is no justification for amputation, for, as Muirhead Little pointed out, the last state may well be worse than the first if the patient is left with a stump which he is wholly unable to control and which is utterly different in use from the strong and perfectly controllable stump that carries the artificial limb in any ordinary case of amputation for trauma.

It is well to remember that any patient can be made to walk somehow—perhaps not well, but still to walk—provided that he has one good buttock; even though one limb be totally flail and the other be severely paralysed he can still be made to walk after a style. Only when both buttock muscles are completely paralysed and the legs are disconnected, so to speak, from the trunk is a patient incapable of being made to walk with the aid of instruments and operation. Flail paralysis, per se, is not an indication for amputation. Neither is the presence of severe contracture, for this can be remedied by capsulotomy, combined, if necessary, with arthrodesis or some other method of stabilisation. Practically speaking, the principal indication for amputation in infantile paralysis to-day is the presence of inveterate ulceration of the affected limb. Even so, every method of conservative treatment should have been exhausted and the capacity of the patient to control an artificial limb if amputation is performed should be most thoroughly considered before the operation is advised.

W. H. LANGLEY MEMORIAL PRIZE.—Applications are invited for the prize founded in memory of Dr. W. H. Langley, C.M.G., principal medical officer of Southern Nigeria. The prize, which is of the value of £30, may be awarded triennially to an officer of the West African Medical Staff, whether on the active or retired list, for the best paper on (*a*) tropical medicine or surgery, (*b*) tropical hygiene and sanitation, or (*c*) tropical entomology and parasitology. The award is made by a committee nominated by the London School of Hygiene and Tropical Medicine, Malet-street, W.C.1, and papers should be sent in before Oct. 1st. Further particulars may be had from the Secretary of the school.

SUPPURATIVE THYROIDITIS.

REPORT OF TWO CASES.

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ALTHOUGH a rare condition, suppurative thyroiditis occurs in both sexes and at all ages. It is most frequently seen, however, in adult women and may arise either in a previously normal thyroid or in a goitrous gland. Continental writers distinguish inflammation of a previously healthy thyroid from inflammation of a goitrous gland by the terms thyroiditis and strumitis, and so speak of either suppurative thyroiditis or suppurative strumitis, but this distinction is not as a rule made by English writers. Not all inflammatory conditions of the thyroid go on to suppuration.

As a rule there is not much difficulty in diagnosis. Following an acute specific fever, or an attack of boils, a swelling appears in the region of the thyroid, the overlying skin becomes hot and reddened, and the temperature and pulse-rate increase. The signs and symptoms of thyrotoxicosis may arise but if extensive destruction of the gland occurs these may be replaced (later) by those of hypothyroidism. One or both lobes of the gland may be affected.

The condition is very painful because of the numerous coverings of fascia which prevent rapid distension of the gland. It will be remembered that between the capsule of the thyroid gland and the skin there are no less than five layers of fascia—the pretracheal sheath, the double layer of fascia enclosing the omohyoid muscles, the vaginal layer encasing the sternomastoids and further back the trapezius muscles, and the superficial fascia with the platysma. Inflammatory adhesions produced between these layers of fascia may mask the fact that the swelling is in the thyroid gland, by preventing the usual up and down movement with deglutition, a movement which normally depends upon the fact that the pretracheal tube of fascia which encloses the gullet, the trachea and the thyroid, moves freely inside the omohyoid fascia. The intrafascial tension may give rise to dyspnœa and dysphagia.

Kocher (1878) was the first to point out that acute thyroiditis was due to metastasis of an infective agent elsewhere in the organism.

Pathogenesis.

Thyroiditis may arise:—

1. By direct infection, the result of penetrating wounds of the thyroid gland. These cases are apparently rare.

2. By contiguity. The infection spreads from a focus in the vicinity as in the following:—

A railway porter, aged 31, complained of a painful swelling of his neck. His past health had been good but he had recently suffered from boils and examination revealed one just above the left sternoclavicular articulation. The left lobe of the thyroid was enlarged and tender, the skin over it red, hot, and fluctuant, and his temperature 100° F. A diagnosis of suppurative thyroiditis was made and under ether anæsthesia the left lobe incised and drained. Several ounces of yellow pus escaped. For some months afterwards a sinus existed but this ultimately healed.

3. By the blood stream. This method of infection is illustrated by the following case:—

A housemaid, aged 48, was admitted to a medical ward under the care of Prof. A. M. Kennedy because of general weakness following influenza. She had suffered from a toxic goitre for many years, and the left lobe of the thyroid had been larger than the right, but about the time of admission both lobes had begun to enlarge. She developed acute pain in the neck and slight dyspnœa. Examination showed that the lower part of the neck was much swollen (see Fig.). The skin over the thyroid gland was hot, reddened, and tender. There was no movement of the swelling on deglutition. A radiogram showed very marked displacement of the trachea to the right. Suppurative thyroiditis was diagnosed and under gas and oxygen anæsthesia 10 oz. of pus were evacuated from the thyroid.

Influenza, as in this last case, is liable to give rise to suppurative thyroiditis; other causes of a hæmatogenous infection are scarlet fever, typhoid or puerperal fevers, pneumonia, tonsillitis, gastro-enteritis, cholera, dysentery, measles, malaria, acute rheumatism, and mumps. Thyroiditis due to rheumatism, malaria or measles however, does not, as a rule, proceed to suppuration, while that following influenza or typhoid, scarlet or puerperal fever, frequently does.

Bacteriology.

The organisms commonly found in the pus are staphylococci or streptococci, or the *Bacillus coli*, but paratyphoid A and B infections have been recorded by French writers. The organism in the postinfluenzal case reported here was a Gram-positive diplococcus of a chain-forming type, which produced colonies

resembling those of the streptococcus. De Quervain believes that suppuration more often follows infection of thyroids containing goitrous nodules than of previously healthy or diffusely hypertrophied glands. He also draws attention to the important fact that chronic suppurative thyroiditis, whether starting in a healthy or diseased gland, is nearly always tuberculous.

Treatment.

The treatment of acute suppurative thyroiditis, like that of suppuration elsewhere, is evacuation of the purulent contents and drainage. André Crotti relates the story of the distinguished surgeon, P. Franck, who when a small boy suffered from suppurative thyroiditis from which he nearly lost his life, "because the best physician in the district pompously declared that the child had ruptured a nerve in his neck and that death was imminent." Franck's mother, however, thinking that the swelling in her son's neck had something to do with his choking, called in a barber and told him to incise the swelling with his razor. Immediately a great quantity of pus gushed out and the dyspnœic symptoms ceased. The fistula which afterwards existed closed spontaneously after seven years.

In those cases in which when first seen the skin is beginning to soften and the pus point, all that is necessary is to make an incision in this area and establish drainage. It is not advisable, however, to wait until the condition has advanced so far, but is better to make a small incision in one of the lower crease lines of the neck; if necessary to ligate and cut the anterior jugular veins or their branches, split and retract the sternothyroids, and expose the capsule of the gland. At this stage, an aspirating syringe is useful; when pus is found the needle track is incised and dilated with sinus forceps. A small glass or rubber drainage-tube is inserted into the abscess cavity. In the latter of the two cases here referred to each lobe was drained in the way described, the two tubes leading out through a small incision, *en cravat*. Between the tubes from the gland a shorter tube was passed down to the cellular tissue of the neck. The wound was healed by the fourteenth day, but the patient subsequently suffered from thyrotoxicosis for which ligation of both superior and the right inferior thyroid arteries was performed in stages.[1]

Dyspnœa in these cases is very rarely sufficiently extreme to demand tracheotomy, the relief of tension in the gland by evacuation of its purulent contents sufficing to relieve the pressure on the trachea. If a sinus persists this may be due to the presence of calcareous nodules in the thyroid, and partial extirpation of part of the gland may be necessary when the inflammatory condition has become quiescent. Suppurative thyroiditis presents no great difficulty either in diagnosis or treatment, but its rarity is well illustrated by an annotation in THE LANCET of Jan. 29th, 1927, in which reference is made to a paper by Dr. H. M. Clute and Dr. L. W. Smith, of the Lahey Clinic and Pathological Department of the Harvard Medical School. Out of 3000 thyroid operations performed in this clinic only three were for suppurative thyroiditis.

Clinical and Laboratory Notes.

TWO CASES OF ADVANCED CARCINOMA OF THE STOMACH.

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IN view of the efforts at present being made to ensure earlier diagnosis of cancer, these two cases may be of interest.

CASE 1.—A man, aged 42, a pilot, was admitted on August 17th, 1925, complaining of pain in the left hypochondrium. He stated that 12 months ago he had begun to notice a feeling of fullness with occasional momentary pain in left side. This occurred about every second day and had no relation to food. As from February, 1925, he had noticed slight loss of weight, and had been to several doctors. In July, 1925, he saw Sir John Bland-Sutton, who told him he had a new growth of the stomach and advised against operation.

On admission the patient was a sturdily-built, healthy-looking man with florid complexion. No definite relation could be established between the pain complained of and ingestion of food. He was able to eat large meals, including meat, with hearty appetite and enjoyment. Palpation failed to reveal the presence of a tumour, although Sir John Bland-Sutton had been able to detect the presence of one.

A blood count gave the following results: red cells 5,010,000, white cells 8800, hæmoglobin, 92 per cent. Radiography after a barium meal showed an irregular filling defect, involving the greater curvature in the pyloric end of the stomach; there was no delay in emptying, but irregular traces of the meal were left in the stomach at seven hours. The appearances suggested a new growth, probably extensive. A fractional test-meal showed diminished total acidity and almost complete absence of free hydrochloric acid. At operation on August 21st it was found that the anterior and posterior surfaces of the stomach in the prepyloric area were extensively invaded by new growth which had involved the omentum. Operative removal was out of the question, and the abdomen was closed.

CASE 2.—A man, aged 48, a farmer, was admitted on Jan. 11th, 1927, complaining of pain before meals and discomfort after. He said that six weeks ago he had begun to have pain in the epigastrium before meals; it was relieved by taking food and did not occur every day; it might be absent for two or three days at a time. His appetite had been good, his food consisted of an ordinary diet, and apart from the slight discomfort complained of, he had been objectively and subjectively in perfect health.

On examination he was a well-built, florid-looking man, and nothing abnormal could be detected in the abdomen, except definite tenderness which could be elicited by deep pressure in the epigastrium. A barium meal showed an irregular filling defect at pyloric end of the stomach. There was no delay in emptying, but suspicious flare remnants were seen at seven hours, and the appearances suggested a new growth. A fractional test-meal showed diminished

[1] This case was shown at a meeting of the Cardiff Medical Society at the Cardiff Royal Infirmary on Dec. 14th, 1926.

total acidity and almost total absence of free hydrochloric acid.

At operation on Jan. 21st the stomach was exposed through a transverse incision dividing both recti, and was found to be the site of a large ulcer involving the anterior wall of its pyloric end. No abnormally large glands could be detected, but the extensive infiltration of the surrounding stomach wall suggested that the condition was carcinomatous. Partial gastrectomy was performed, with direct union of the jejunum with the cut end of stomach.

A pathological report stated that the growth was a spheroidal-celled carcinoma, infiltrating the wall of the stomach. The lymphatic gland selected for section was not involved.

Convalescence was uninterrupted and the patient was discharged on Feb. 14th.

The special interest in these two cases lies in the almost complete lack of symptoms found in either of them. Both patients looked extraordinarily healthy and there was no wasting or anæmia, no anorexia, and only very slight discomfort. Very little could be found on examination. In fact, without the aid of X ray and the laboratory, diagnosis would have been almost impossible. The probability is that without the warning of Case 1, the second patient would not have been investigated until the condition was inoperable.

For permission to publish these cases I am indebted to Sir John Bland-Sutton and Mr. Percival Cole. They were both under the care of Mr. Cole at the hospital.

THE USES AND LIMITATIONS OF CREAM IN INFANT FEEDING.

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THE term "cream" is now applied in a wide sense and requires defining. By "cream" may be meant: (1) cows' milk or breast milk cream, or (2) synthetic cream, such as emulsions of cod-liver and other oils, known as Marylebone cream, New Zealand cream, and Vitoleum cream.

Is there any particular value in high cows'-milk-cream-content in infant feeding? Are whey-cream mixtures of great value? Is very creamy dairy milk to be greatly sought after? To answer these questions they must be considered from all sides. If the infant be absolutely normal it takes such feeds and thrives on them. That it thrives on them better than on less creamy foods, however, is a matter of debate. Nevertheless, it does thrive. There are numbers of infants, however, who are quite unable to manage a high fat-content in their feed, and possibly these represent 1 in 10 of the population. To these infants such creamy mixtures are indigestible; they are not tolerated. The fact that an infant thrives on a high fat diet is a guarantee of its normality. Now let us consider the normal infant on this high fat diet when it is suffering from some mild or severe infection. There is no doubt whatever that a severe degree of acidosis occurs in such a child as the result of its infection, and that this violent reaction would not occur if it were on a less ketogenic diet.

The normal healthy infant may tolerate much fat during the cooler months of the year, but during the summer months, in a still atmosphere, a violent intolerance is apt to be shown if the food is pushed a little too far and the child urged over its bottle. This bilious attack is less likely to occur if the child's diet is lower in cream. Finally, the vitamin-content of milk varies with the season of the year and the food of the animal producing it. In the winter months it has been shown that stall-fed cattle, much confined in dark stables, produce cream with extremely little vitamin.[1] Probably on the whole, then, the disadvantages of high fat feeding outweigh the advantages.

[1] Chick and Roscoe: Biochem. Journal, 1926, No. 3, xx., 632–649.

Regarding synthetic creams, such as the various forms of cod-liver oil emulsion on the market and such creams as Marylebone cream, New Zealand cream, and vitoleum cream, another view must be taken. That these creams are of great value to the infant apart from their vitamin-content is most debatable. In other words, a good brand of cod-liver oil emulsion, given in eggspoon doses, or a few drops of plain cod-liver oil three times daily immediately before feeds, is of as great value to the infant. The nipple or teat should be placed in the baby's mouth at once, the cod-liver oil being washed down with the milk. There are extremely few infants who do not tolerate minute doses of cod-liver oil if given in this way before their feeds. Many mothers complain that the food is vomited, but probably it is their own distaste for the oil which makes them administer it in a shrinking or awkward manner, causing the child to return it. Putting the cod-liver oil in the bottle is useful, but it tends to remain behind on the sides of the bottle and in the teat itself. When it is administered separately *after* the feed there is a danger, if it is awkwardly given, that the whole feed will be returned.

To prolong feeding on milk—that is, feeding on an exclusive milk diet after six months—necessitates large quantities of milk being given. This means, as a rule, a proportionate steady increase in the quantity of fat or cream being metabolised, and a tendency occurs in certain children to develop a chronic fat intolerance or inability to absorb the fat, known as cœliac disease. Probably the greatest error made in feeding older infants and children is the too long continuance of the exclusive milk diet or the administering of milk in too large quantities.

To conclude, therefore, quite sufficient fat or cream is present in an ordinary diluted cows' milk feed without any further additions. Every infant, however, breast-fed or bottle-fed, should be given cod-liver oil in small doses from birth for its vitamin-content rather than for its food value.

TWO CASES OF BUBONIC PLAGUE.

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THE following cases will probably be of general interest by reason of the comparative rarity of bubonic plague in this country. The second case was discovered accidentally, the man not having sought advice. A brief report of the two cases appeared in THE LANCET of Sept. 11th, 1926 (p. 573).

CASE 1.—A boy, aged 10, was admitted to the David Lewis Hospital at 6 A.M. on August 28th, 1926, having complained of headache and nausea since the previous evening; during the night he had vomited several times, and towards morning had experienced short periods of delirium.

On admission he appeared to have some abdominal pain, but there was no resistance or tenderness, except in the left groin, where there were enlarged glands which appeared painful on palpation. The spleen was not palpable; nothing abnormal was found in the chest; the reflexes were normal; the patient was flushed; the temperature 106° F., the pulse-rate 36, and the respiration-rate 36. (The temperature remained above 101° F. throughout the illness, except during the two hours following lumbar puncture.)

During the day the patient was semi-conscious, with periods of delirium; obviously there was severe toxæmia. Blood was taken for a Widal reaction, which was reported negative for the typhoid group.

On the 29th the boy persisted in lying on his right side, with the head thrown back, his condition rather suggesting meningitis, although Kernig's and the usual ocular signs were absent. Lumbar puncture was performed, and about 5 c.cm. of fluid were withdrawn; it was clear and not under pressure. He seemed slightly relieved for a few hours, and the temperature, pulse- and respiration-rate dropped, but they rose again later. Blood and fluid were put into culture media, but on incubation proved sterile. No clot formed in the fluid on standing. During the day delirium became more marked; morphia gr. 1/6 was of no avail; later

hyoscine hydrobromide gr. 1/100 quietened him for some hours.

On the 30th he was delirious and required restraint; by about midday his pupils had dilated, the head was retracted, and breathing had become stertorous. He collapsed suddenly about 3 P.M.

At the *post-mortem examination* made by Dr. L. Cunningham, pathologist to the hospital, nothing abnormal was found except a mass of enlarged hæmorrhagic glands in the left groin. These were removed and submitted to Dr. L. S. Ashcroft, assistant city bacteriologist, and bacteriologist to the hospital. Direct smears showed organisms very suggestive of *Bacillus pestis*. A guinea-pig and rat were inoculated, and within 24 hours were obviously fatally affected; they died within 48 hours, and cultures from them confirmed the suspicion of *B. pestis* infection.

CASE 2.—The father of the boy, aged 60, came to the hospital on August 30th in connexion with the death of his son. He looked ill and on question complained of having had headache (pains over eyes and back of neck) and nausea since the previous Friday; he also felt "good for nothing" and looked it. When asked, he said he had a small swelling in right groin, only noticed on Sunday, and not painful. His temperature was 98·6° F. and varied between that and 97° while in hospital. The pulse-rate was 120, and settled down to 100; the respiration-rate was 28, and varied between 20 and 28. The bowels were rather constipated.

With some persuasion he came into hospital for a rest; and on further persuasion he agreed to part with his gland; this was removed on the following day under local anæsthesia, and was found to contain pus. This, with a portion of the gland tissue, was sent for bacteriological examination, results being again indicative of *B. pestis*.

The man and his family were taken to the Port Isolation Hospital, but no further cases developed.

Four weeks later, after discharge from isolation, he looked much fitter and was ready for work.

This patient (Case 2) worked in an office on the grain wharf. He was not employed in actual contact with cargo, but there were rats in his office, and one had been seen in his home. It is suggested that the train of infection was probably from a grain ship, via grain wharf and office to the man, and thus to his home. A thorough investigation and all necessary precautions were taken in hand by the public health authorities.

I am indebted to Dr. J. Murray Bligh, senior physician, and Dr. L. Cunningham, assistant physician, for permission to publish these cases, which were admitted to hospital under their care.

Medical Societies.

ROYAL SOCIETY OF MEDICINE.

COMBINED SECTIONS OF ODONTOLOGY AND DISEASES OF CHILDREN.

ON April 6th these Sections held a joint discussion on

ORAL MANIFESTATIONS OF GENERAL DISEASE IN CHILDREN,

the chair being occupied by Mr. J. B. PARFITT, the President of the Section of Odontology.

Mr. A. T. PITTS presented the point of view of the dental surgeon to whom, he said, nothing appertaining to the mouth was foreign. He would not attempt to catalogue the oral manifestations which were due to systemic disease, but would pick out for consideration some which had come under his notice and excited his interest, and he would ask questions to which an answer would be valuable.

Osteomyelitis of the maxilla might, he said, occur in babies only a few months old. Was the condition in these infants a true osteomyelitis or an antral infection? As in very young subjects the maxilla was a thin shell of bone containing the developing teeth, the crypts of the teeth soon became infected, and often such cases came under the dental surgeon's care. The treatment should be cautious and limited. The necrosis might last a long time, but it did not seem to become acute nor to spread rapidly. In cases of tuberculosis of jaws which he had seen in children the infection had been in the mandible, and he asked whether in these cases the disease was secondary to tubercle in some other part of the body. Could it occur in a clean mouth, or must there already be a dental infection?

Turning to localised suppuration of the jaws which originated elsewhere than in the teeth, he said that cases were sometimes encountered in which the conditions resembled alveolar abscess, and he asked for suggestions as to their pathology. In order to exclude a dental cause a radiogram must be taken; apparent healthiness of the teeth was no criterion. He had seen a number of cases of this kind in which the patient had been for some time under medical care without the condition having been suspected. Removal of the offending tooth had led to cure.

Necrosis of jaw following scarlet fever appeared to have been common some time ago, but was now rare. An instance had been reported to the Odontology Section by Mr. T. B. Layton. With regard to tooth changes found in congenital syphilis, Mr. Pitts said that Hutchinsonian teeth showed two features—namely: (1) an alteration in the architecture of the tooth, so that its sides converged towards the cutting edge; (2) the existence of an area of badly formed enamel on the cutting edge; or there might be an actual deficiency of enamel leading to a notch or rendering one likely. Speaking of anomalies of eruption and development, he asked whether rickets retarded eruption, and if so, whether the retardation only affected the deciduous teeth or also the permanent ones. Sometimes dentition was in advance of the child's years. Did this point to the development of the teeth being regulated by the endocrine glands?

In conclusion Mr. Pitts dealt with oral manifestations such as scurvy due to vitamin deficiency. It had been suggested, he said, that follicular stomatitis in children could be attributed to lack of water-soluble vitamin B.

Dr. ROBERT HUTCHISON, from the medical aspect, said that the affections of the jaw in general disease were more surgical than medical, but general hypoplasia of the skeleton—e.g., in some forms of infantilism—affected the jaws, and it was interesting to speculate as to what part was played in this by endocrine disturbances. Over-action of the anterior lobe of the pituitary caused an overgrowth of the lower jaw in acromegaly, and possibly pituitary deficiency might result in under-development of the jaw during the period of growth. But in cases of dyspituitarism such an under-development did not occur. There was even less reason to believe that deficiency of vitamin B in the diet could interfere with the development of the jaw, as had been suggested. Rickets, however, could act in this way, though he thought it did so less than had been supposed.

The teeth seemed to be more affected by general disease than did the jaw. In rickets the appearance of the teeth was delayed. He thought the teeth were a better index of the real age of the patient than was the stage of ossification of the epiphyses. The influence of general disease on the calcification of the teeth was very important, as was well seen in rickets, and Mrs. Mellanby had shown that this was due to a deficiency in vitamin A. The effect of inherited syphilis on the teeth was well recognised, and anything which impaired the general health might interfere with the laying down of enamel; measles and pertussis were very apt to act in that way. Dr. Hutchison thought that variations in the reaction of the saliva due to affections of general health might affect the enamel. In nervous children the saliva was apt to be unusually viscid. Children who were mentally defective and those who suffered from

dyspepsia—perhaps also those with worms—were apt to grind their teeth. The gums, being highly vascular, easily became affected in hæmorrhagic diseases, such as scurvy, the lymphatic leukæmias, and purpura. Hypertrophy of the tongue was met with in cretinism, and to some extent in Mongolism. Affections of the mucous membrane of the mouth were, in his view, for the most part purely local, and did not indicate any general disorder. This was certainly true of the common forms of stomatitis, but in the ulcerative and gangrenous form lowering of the general health played a large part. He did not feel convinced, however, that vitamin deficiency was a factor in this debility. In the delayed form of inherited syphilis there might be perforation of the soft palate; often it was associated with interstitial keratitis. He could not say whether the teeth also were affected.

Summarising, Dr. Hutchison said that the oral manifestations of general disease in childhood were, except in the case of the teeth, neither numerous nor important. He believed, also, that too much emphasis was laid on the supposed effects of oral disease on the general health.

Discussion.

The PRESIDENT said that the great resistance of the oral tissues to trauma and to all kinds of bacterial invasion might partly explain why the oral manifestations of disease were not very marked.

For the production of caries it seemed necessary that certain organisms should be present, but there must be something in addition, otherwise every tooth would be carious. He had met with ropy saliva in association with caries, but not in children, though they were particularly liable to caries. He wondered whether there might be some endocrine disturbance which influenced the degree of immunity to bacterial invasion. And in periodontal disease there was some factor beyond mere infection; it was rare in children, common in adults. The dental surgeon could keep a careful watch on the children who came to him from time to time, and if he found that a child who had been normal began to develop facial irregularity or caries, he should see that the medical man was apprised of it.

Dr. H. C. CAMERON spoke of two distinct types of children, in one of which the teeth were habitually faulty, whilst in the other they were comparatively well formed, well erupted, and with good enamel. Caries was apt to occur chiefly in the child with a high lymph content in its body, as shown in adenoids and enlarged tonsils. Such a child had a large appetite, a clean tongue, and loose bowels, and showed a marked tendency to catarrh; this catarrh, he thought, conduced to an inefficient functioning of the enamel organ. Sometimes in these children the molar teeth were not erupted vertically, but lay almost on their side, so that instead of the grinding surfaces meeting surface to surface they met at their edges. The other type of child, with good teeth, usually had an intellectual inheritance, and the metabolic instability with which this was usually associated, often including attacks of sickness and cyclical vomiting. Mothers were frequently advised to see that their children were given hard foods so that vigorous biting was necessary, in order to ensure a proper development of the jaws. But he thought a child who developed well and had good neuromuscular control, and who walked and talked early, could be trusted also to use its jaws efficiently. On the other hand, a child whose infancy was punctuated by repeated attacks of catarrh and who was slow in walking would probably use its jaws late and perhaps insufficiently.

Dr. DAVID NABARRO dealt with the question of the teeth in congenital syphilis. He said that when people talked of Hutchinsonian teeth they had in mind the teeth which showed the characteristics grossly so that they could scarcely be missed. Such teeth were rare. The common Hutchinsonian teeth were those with the characteristics less marked, and they were often overlooked. His experience was that the lower incisors showed these features when the upper incisors were markedly Hutchinsonian; they were small, their anterior surfaces were very convex, and the teeth were widely spaced. He had looked up the records of 208 children under 7 years of age. Of these 32 had typical Hutchinsonian teeth, whilst the remainder had not. He had had 12 cases of ulceration of the palate in 12 years. This, with perhaps gummatous disease of bone, was evidence of syphilis. Most of these children were from 8 to 10 years of age. In only one of the 12 cases were the teeth Hutchinsonian, and in this case the boy had bosses on the head, was deaf, and had interstitial keratitis and choroiditis; yet he looked healthy, and it had been difficult to persuade the parents to let him come for treatment. In two of the other children there was wide spacing between the lower incisors, and one had a notched incisor. Therefore it was not possible entirely to accept Hutchinson's statement that the teeth were not affected when the palate was ulcerated. In cases of ulceration of the palate the Wassermann was very resistant; he had got a negative Wassermann in only four of the 12, and in the others it was resistant, though tested over a period of five or six years, the children meantime having had 20 to 40 injections of novarsenobenzol. He had examined the cerebro-spinal fluid of 11 of the 12 patients, and in all but one of them it had been negative; that one case had had hydrocephalus and optic atrophy.

Mr. F. N. DOUBLEDAY related a case in which the diagnosis of syphilis was made because of lesions of the mouth, and in which the conditions had turned out to be lichen planus with unusual oral manifestations. Dr. Hutchison, he thought, was apt to belittle manifestations of disease as found in the mouth. A condition in children which might somewhat simulate osteomyelitis of the jaw of adults was an infection of the crypts of the permanent teeth beneath the temporary teeth. Stomatitis due to *Bacillus fusiformis* yielded readily to treatment with chromic acid. He asked about the influence of preparations of ductless glands on some mouth conditions in children. In the case of a woman, aged 18, who seemed like a child of 8, the medical man had given ½ gr. doses of dried thyroid extract, after which she began to grow, and the teeth erupted well. He had also seen cases in which the jaws grew after anterior pituitary extract. He expressed his regret that so many practitioners advised mothers to give their children plenty of sweets, for he believed that such messes remained only partially digested in the alimentary tract and afforded a suitable pabulum for streptococci.

Dr. J. KINGSTON BARTON thought that much of the maldevelopment of the lower jaw seen in children and also in adults was due to bad feeding in early childhood. He agreed with what Mr. Doubleday had said in regard to children eating a lot of sweets.

Mr. P. G. DOYNE spoke of the association of lamellar cataract with defective enamel on the teeth. His experience was that Hutchinsonian teeth were infrequently associated with interstitial keratitis.

Dr. A. LIVINGSTON said there were two types of inflammation of the gum margin—one of them local, due to carbohydrate stagnation, and the other caused by a general lowering of the resistance of the body, often accompanied by constipation or by such systemic upsets as diarrhœa.

Dr. ALAN MONCRIEFF asked whether the statement was true that in congenital syphilitics the teeth commenced to erupt much earlier than normal.

Mr. HAROLD CHAPMAN said that he regarded irregular teeth as an expression of bad development of the maxilla and mandible, and therefore of the bones of the face. He had no reason to believe, from the investigations he had made, that an undeveloped or a badly developed jaw was due to bad feeding. The question whether orthodontic treatment should be accompanied by medical treatment was one for the decision of the general physician.

Mr. PITTS and Dr. HUTCHISON replied.

NORTH OF ENGLAND OBSTETRICAL AND GYNÆCOLOGICAL SOCIETY.

A MEETING of this Society was held at Liverpool on April 1st, Prof. FLETCHER SHAW, the President, in the chair.

Dr. J. W. A. HUNTER described his observations on

Experimental Endometrial Grafts.

Although, he said, a considerable amount of work had been done on this subject, all workers appeared to be satisfied when they had demonstrated the possibility of heterotopic endometrial growth. No one had as yet reproduced in animals a condition comparable to that of tarry ovarian cysts in women.

His own work had been carried out on some 40 rabbits and the transplants were mostly autogenous, but a few were heterogeneous. The general reaction obtained was the growth of a multilocular cyst lined by columnar epithelium which was non-infiltrating; there was stromal proliferation in the papillary buds only. In rabbits killed on the third and tenth days after grafting two methods of cyst formation were found. The epithelium either dipped down into the graft to form a cyst, on it covered the graft and lined the under surface of the layer of fibrin which sealed in the graft. It was also noticeable in these experiments that whilst the columnar epithelium was scanty in the depths of the graft, it always covered the outer surface and grew along the lines of tissue junction. The stroma in the early stages was engorged.

In order to test the effect of vascularity some grafts were placed in the liver and some in an avascular part of the abdominal wall in the same rabbit. The former showed considerable proliferation of the endometrium with preservation of the racemose gland arrangement, but it was surrounded by a definite capsule. The latter showed a scanty growth of epithelium of a low activity. Even after 290 days a very active growth was found in the liver, but growth was not so exuberant in the ovary. In another animal after 388 days the general reaction was obvious, and after 760 days very small cystadenomata were found in atrophic ovaries.

To test the influence of ovarian hormone grafts were made into the ovaries; two ovaries from another animal, containing corpora lutea, were transplanted into the abdominal wall. Fifty-four days later very large cystadenomata were found with adhesions to many adjacent organs; microscopically they showed large thin-walled cysts without invasion of surrounding structures. This result could only be obtained when the grafted ovaries from another animal contained corpora lutea. In an experiment in which the grafts were placed in the abdominal cavity of a male rabbit it was found 30 days later that there was no trace of the columnar epithelium, but the gland spaces remained. An attempt to confirm the "serosal" theory by the implantation of pieces of peritoneum and subperitoneal tissue gave a negative result, although there was an active growth of the mesothelial tissues. In one case in which grafts were placed in the ovary, and the ovary was then transplanted into the abdominal wall, definite endometriosis with invasion was produced.

Dr. Hunter concluded from this series of observations that fragments of endometrium, when grafted into any organ, could grow. The factors which controlled growth of the stroma and endometrium were not the same, and the hormone of the corpus luteum had a selective action controlling growth of the endometrium, more especially its epithelial portion. The experiments showed, he said, that whereas implanted endometrium could continue to grow for an almost unlimited time it did not, under normal circumstances, become invasive. In the one instance in which an abnormal factor was present (transplantation of the ovary which was the site of the graft) the typical picture of endometriosis was obtained. This rather suggested that for the production of the human picture one factor—either the endometrium or the invaded tissue—must be abnormal.

Dr. Hunter expressed his indebtness to Prof. H. S. Raper and the staff of the Physiology Department of the Victoria University, Manchester, for the facilities extended to him.

Dr. S. B. HERD asked whether the time in the œstral cycle at which the endometrium was taken for grafting made any difference to its capacity for growth.

Prof. BLAIR BELL expressed his appreciation of Dr. Hunter's work. He passed round a specimen—one of several—obtained in his own laboratory, showing that it was possible experimentally to secure not only an endometrial tumour by implantation, but also, during pregnancy at any rate, to produce a shower of glandular implants over the whole peritoneal surface of the abdominal cavity.

The PRESIDENT also congratulated Dr. Hunter on his work, and stressed the importance of comparing clinical and experimental results.

Dr. HUNTER, in reply, said that in his experience the time in the œstral cycle at which material was obtained for grafting made no difference to its capacity for growth.

Prof. DANIEL DOUGAL reported

An Unusual Malformation of the Left Broad Ligament.

A married nullipara, aged 45, complained of a blood-stained discharge of 12 months' duration; a severe hæmorrhage had occurred two months before she was seen. The uterus was enlarged; the cervix was much thickened, very hard and stretched, and there was a good deal of bleeding on examination.

On opening the abdomen it was found that the uterus contained a number of fibroids, including one in the cervical canal. The main interest, however, lay in the malformation of the left appendage. The left ovary lay with its inner pole close to the internal abdominal ring, and running from it into the inguinal canal was a thick muscular cord, about one-eighth of an inch of this being visible between the ovary and the ring. The ovary was normal in appearance. The left Fallopian tube was somewhat small, and terminated on the outer side of the ovary more than 2 inches from the uterus. The fimbriated end was fully developed. The kidney and ureter were completely absent on this side.

Running from the ovary towards the uterus was a fold of peritoneum, in the outer part of which could be made out a fibromuscular structure, which tapered to a point and terminated about 1 inch from the uterus. The peritoneal fold joined the uterus about the junction of the body and cervix. The right ovary and tube were apparently normal, and were attached to the uterus at a much higher level than the peritoneal fold on the opposite side. The uterus itself was much distorted by the presence of fibroids, but was assumed to be of unicornuate type, the left horn being completely absent. The upper part of the left Müllerian duct formed the Fallopian tube, and there the further development of this structure had ceased. The Wolffian structures on this side were evidently absent.

The position of the ovary at the internal abdominal ring was interesting, said Prof. Dougal, as the fibromuscular cord attaching it to the ring presumably represented both ovarian and round ligaments. As the Müllerian duct on this side had not grown inwards to fuse with its fellow of the opposite side, the gubernaculum had drawn the ovary straight downwards to the inguinal ring. The malformation was undoubtedly rare, and he had only been able to find a record of one somewhat similar case, published by Bonnaire and Durante in 1912.

Prof. BELL said that true uterus unicornis was very rare. Most cases so described had been, in reality, cases of uterus bicornis in which one horn is poorly developed. Two other points of interest were demonstrated in Prof. Dougal's specimen. First, the ovarian ligament on the side on which the uterine horn had not developed ran straight to the inguinal ring, indicating the truth of views emphasised by Prof. Bell many years ago that the round ligament and the ovarian ligament were one structure, and together represented the gubernaculum. The second point of interest was that, although the Fallopian tube as a whole was not formed, the fimbriated extremity was present—a matter of common observation in many cases of malformation

of the parts, and one which bore out Keith's contention of the origin of the fimbriated extremity from the pronephros.

Prof. DOUGAL also described a case of

Unilateral Duplication of the Ureter with One Ectopic Opening.

The patient, aged 24, unmarried, consulted him because of deficient control over micturition almost since birth. She was able to pass urine in the ordinary way, but in addition was wet both night and day. She always wore a diaper and used three in the 24 hours, one during the night and two during the day.

On inspecting the vulva Prof. Dougal thought that he observed urine welling up from the vagina. He therefore decided that the condition was more than a mere weakness of the sphincteric control of the bladder, and admitted her shortly afterwards to a nursing home for further investigation under anæsthesia. During this examination he found that the urine escaped periodically from a small opening in the vestibule just below the urethral opening and a little to the right of the middle line. The urine coming from this opening did not pass through the bladder, and it was therefore evident that the condition was one of ectopic ureteral opening.

It was suggested that a general surgeon be called in to investigate the urinary tract, and Mr. Wilson Hey found that there were two ureteral openings normally situated in the bladder, and that both were acting normally. In addition there was a second ureter on the right side and this one had an ectopic opening on the vestibule. Sodium bromide was injected into the bladder opening of the right ureter, but only a small quantity could be passed in, and there appeared to be some obstruction in the upper part. Sodium bromide was also injected into the ectopic opening of the right ureter and passed freely up to the renal pelvis.

Evidently the patient had two pelves and two ureters on the right side, said Prof. Dougal, and one of these ureters had an ectopic opening from the vestibule. The abnormality was obviously of clinical importance, but was also interesting from an embryological point of view, as the ectopic ureteral opening in this case was situated at the point where Gartner's duct was usually supposed to terminate. An exhaustive paper on the subject had been published by Kilbane in *Surgery, Gynecology, and Obstetrics*, 1926, vol. xlii.

Prof. ERNEST GLYNN described a case of

Idiopathic Dilatation of the Bladder.

The patient was a woman aged 48. Trabeculæ were well developed in the bladder and a small sacculus was present. There was also a moderate amount of bilateral hydronephrosis. The uterus was normal. Prof. Glynn had made post-mortems on two similar cases in men, and wondered how far such a condition might be produced by habit. It must be remembered that idiopathic hypertrophy of the bladder with hydronephrosis was described in children. He himself had seen the condition post mortem in males aged 12 and 16.

Dr. J. E. GEMMELL described two cases he had seen. In the first no cause could be assigned but in the second the condition had certainly been due to habit. Finding it very difficult to leave her work, the patient had accustomed herself to going all day without emptying her bladder.

Dr. W. W. KING also quoted two cases due to habit, one in a cinema pianist and the other in a chronic alcoholic who had prolonged periods of unconsciousness.

Prof. GLYNN, in reply, quoted a similar case in a policeman who was on point duty for long hours at a time.

Prof. BLAIR BELL described a case of

Primary Adenocarcinoma of the Fallopian Tubes.

The patient was a 1-para aged 45. She complained of pain in the back and hypogastrium and a yellow inoffensive discharge for 12 months; there was frequency of micturition and she became exhausted on the slightest exertion. The uterus was thought to be enlarged, irregular, and immobile. A large swelling was felt through the anterior fornix evidently pressing on the bladder. A hard mass was felt on either side of the uterus. Panhysterectomy with bilateral salpingo-oöphorectomy was performed, but was extremely difficult owing to the density of the adhesions and the presence of bilateral ovarian cysts, which appeared to burrow deeply in the loose tissues of the pelvis. Subsequently a small vesico-vaginal fistula was found and easily repaired.

Primary carcinoma of the Fallopian tube, said Prof. Bell, was rare, less than 150 cases being reported in the literature. Probably the condition occurred with greater frequency, but the cases were not recorded. He had had three cases but the other two cases had not previously been fully reported. In reply to a question, he said that he considered primary carcinoma of the Fallopian tube on a par as regards malignancy with adenocarcinoma of the body of the uterus. For a long time, that is to say, the disease remained enclosed within the tube and during this period extension or metastases were rare. Once, however, the tube wall was penetrated extension was rapid.

Prof. Bell also showed three cases of Krukenberg tumour and a case of carcinoma of the cervix with pregnancy.

Mrs. DOBBIN CRAWFORD reported a case of double vaginal cyst arising from Gartner's duct.

NORTH-WESTERN TUBERCULOSIS SOCIETY.

A MEETING of this Society was held in Manchester on March 31st, Dr. A. ADAMS, the President, in the chair.

Prof. S. LYLE CUMMINS read a paper on

The Bearing of Recent Laboratory Research on Clinical Conceptions in Tuberculosis.

His experience in the post-mortem room, he said, had impressed upon him the pleomorphism of tuberculosis in human beings as compared with its uniformity in animals. In the laboratory animal there existed what might be called natural tuberculosis, the same characteristics being found also in infants and primitive races—namely, generalisation of the disease with rapid termination. This was in contrast with tuberculosis as usually seen in human beings—that is to say, pulmonary disease. Some modifying factor appeared to have been at work, and modified tuberculosis tended to be localised in the lungs. In between was the big zone of surgical tuberculosis. It was the aftermath of an unrecognised general tuberculosis, causing metastatic deposits via the blood stream. A later stage was localisation of the disease in the lungs. In natural tuberculosis the tuberculin test produced a negative or slight reaction; in modified tuberculosis it produced a marked reaction. Natural tuberculosis was characteristic of non-allergic age-groups and races, whilst modified tuberculosis was characteristic of allergic age-groups and races, the modifying factor being the production of allergy.

There were three questions concerning pulmonary tuberculosis which were still unsolved: 1. Is the disease caused by the reawakening of an infection in childhood, or due to the reinfection of an allergic lung? 2 Do the bacilli enter through the alimentary tract or by the inspired air? 3. Why is the disease more commonly apical than otherwise?

As regards the first question, much experimental work had been done. Baldwin had taken infected guinea-pigs and had tried to reinfect them; he had found them very resistant to reinfection, but had succeeded with large doses. Krause and Willis had introduced an emulsion of bacilli into the skin of guinea-pigs, and had found that, even one hour after inoculation, excision of the piece of skin infected was too late to prevent infection of the animal. If, however, the animal had previously been infected, five days was not too late, which showed that there was great retardation in infected animals. Similarly, they had found that in previously uninfected animals the neighbouring glands were reached within 24 hours, but in animals previously infected they were not reached in 21 days. Thus a previous infection caused retardation and modification of disease. The presence of scars in the lungs of adults was evidence that much early tuberculosis in children did heal.

There was a correlation between physiological influences—e.g., childbirth, lactation, and strain—and infection, and this pointed to the awakening of an old infection. On the other hand, no infection came from healed scars. It was difficult to establish definite sources of infection, but these certainly did occur. Experiment had shown that if an emulsion of bacilli was injected into the posterior nares of rabbits under an anæsthetic either lung could be infected. Soper had repeated these experiments with X ray control, and definite parenchymatous lesions had been shown in the lungs of allergic rabbits long before rabbits previously uninfected showed lesions. But the reaction in the latter, though delayed, was more serious. Calmette held such experiments to be unnatural. The evidence on the first question was thus inconclusive, but it was clear that pulmonary tuberculosis was due to a reawakening of previous infection, and there was strong evidence in favour of reinfection.

As regards the second question, continued Prof. Cummins, Calmette believed in the alimentary route of entry. Guinea-pigs fed on fatty broth containing bacilli showed bacilli in the lacteals in three hours. In early life the mucous membrane was more easily permeable; on the other hand, it was to be noted that in later life most bacilli in the lungs were of human type, whereas swallowed bacilli were usually bovine. Moreover, in spite of much swallowed sputum, intestinal ulceration was comparatively rare. Calmette, however, maintained that in animals infected in the laboratory the lungs were always infected. Prof. Cummins himself believed that both types of infection occurred.

Referring to the third question, Prof. Cummins quoted Bacmeister's experiments in which the apices of rabbits' lungs were constricted by rings. When bacilli were injected intravenously (ear) there was a concentration of bacilli under the rings, but when bacilli were puffed down the respiratory passages no such concentration occurred, the lesions being general in the lungs. These experiments could not really be regarded as satisfactory, owing to the stagnation of the circulation caused by the rings. He had himself made observations on groups of coal-miners and had found that in those who had worked with silica the lymphatic blockage was more effective at the apices than elsewhere, whereas normally coal dust was readily dealt with by phagocytosis.

A discussion followed.

Reviews and Notices of Books.

THE SPECIALITIES IN GENERAL PRACTICE.

Compiled by FRANCIS W. PALFREY, M.D., Instructor in Medicine at Harvard University in collaboration with others. London and Philadelphia: W. B. Saunders Company. 1927. Pp. 748. 30*s*.

THIS book has been skilfully designed "to simplify the problem of the general practitioner in dealing with specialities." Recognising that in the course of his training the medical student's instruction in special subjects is usually insufficient to give him practical familiarity with them, the compiler of the volume has produced a mass of information on these subjects which, while concise enough to stand as a reference book, is discursive enough to provide good reading. There are 11 sections: the first on dermatology, written in collaboration with Dr. Lawrence Oliver, introduces a new classification, in which symptomatology rather than pathology is the determining factor; this arrangement should be of assistance to the practitioner, as it is for symptoms that his patients present themselves, and the pathology of diseases of the skin is especially obscure. This section occupies over 100 pages. Dr. Dellinger Barney has assisted in the succeeding section on genito-urinary surgery. An essay on sexual hygiene is followed by concise descriptions of the common diseases met with in practice. In the third section, on gynæcology, Dr. W. P. Graves and Dr. F. A. Pemberton collaborate with good results. Dr. Crosby Green helps with the fourth section which deals with rhinology and laryngology; special attention is paid to the various types of sinusitis. Dr. James Torbert is concerned with a 40-page section on obstetrics in which antenatal care and examination receive emphasis; an extended position of the thighs during the passage of the perineum in labour is thought to be prophylactic against perineal tears. A systematic description of ophthalmological conditions constitutes the sixth section, the subject matter being founded on Harvard lectures by Dr. George Derby. The failure of the general practitioner to recognise early glaucoma is stressed.

Some lectures by Dr. R. B. Osgood and Dr. N. S. Allison are the basis of a large section on orthopædics; in it methods of examination are usefully tabulated. Arthritis deformans is divided into the atrophic or proliferating and hypertrophic or degenerative types, alternative names which do not flatter the ætiological knowledge of chronic arthritis now available. Talipes, wry-neck, and other deformities are dealt with, foot-strain receiving special attention. Dr. Harold Walker's lectures on otology form the basis of the eighth section, which is prefaced by a good anatomical summary. Diseases of infancy and childhood are well condensed in a section on pediatrics compiled with the help of Dr. Richard Smith and Dr. Randolph Byers; it includes a useful page or two upon examination of the new-born infant and an efficient account of breast and artificial feeding, cows' milk being set forth as the proper basis for the latter. The tenth section on psychiatry, written by Dr. H. C. Solomon, is an excellent instance of the useful nature of the whole book. Probably in no specialty is the average general practitioner so little instructed as in mental disease, and this section provides in a simple form a detailed survey of abnormal psychical states whether dependent on gross disease or functional. The volume ends with a section of 100 pages on surgery, which omits few common conditions from its concise survey, and deals briefly with such practical emergencies as shock, drowning, hæmorrhage, and snake-bite. It is written in collaboration with Dr. Channing Simmons, and concludes with a very complete schematic tabulation of the treatment of fractures.

This book, in all its eleven sections, draws attention in a valuable way to, and provides a remedy for, a very real need in the busy life of the general practitioner. It steers a middle course between the rule of thumb method and too much discursiveness; the teaching is orthodox, definite and practical, and should ensure the success of the book. All concerned in its production are professors or instructors in the Medical School of Harvard University.

MEASLES.

La Rougeole—Épidemiologie, Immunologie, Prophylaxie. By ROBERT DEBRÉ and PIERRE JOANNON. Paris: Masson et Cie. 1926. Pp. 288. Fr.35.

A SURVEY of the recent work on measles from the standpoint of epidemiology, immunology, and prophylaxis is most opportune. This work does not pretend to be an exhaustive treatise but contains largely the authors' own experience and research, and is a useful contribution to the literature of the subject of measles. The first part of the book deals with epidemiology, and includes chapters on the mortality from measles and the factors influencing it, such as sex, age, surroundings, and the social factors concerned in the greater death-rate amongst the working classes. In the second part, dealing with immunology, the authors discuss the susceptibility of man, the various types of the disease, infectivity, and the production of immunity. Lastly,

there is a section on prophylaxis, which contains a chapter on general prophylactic measures. The remainder of the section—which takes up about half the book—is devoted to an exhaustive account of the prevention of the disease by means of serum from a convalescent patient. Numerous protocols are described in detail. A chapter is devoted to the obtaining and preservation of the serum, to its administration, and indications for its exhibition. Full details are given of results, and the reasons for failure are enumerated. An account of the organisation devised for the collection and distribution of convalescent serum in France and other countries is included. The use of blood and serum from persons having had measles some time previously, and not in the category of convalescent, is discussed. Lastly, the authors review the literature on active immunity against measles, beginning with a full account of the work of the Edinburgh physician, Francis Home, who in 1758 applied blood from a measles patient to a scarified surface of the arm, as in vaccination against small-pox. The account of the work on the active immunisation against measles up to the present date shows that the results which have been published up to the present are surprisingly meagre.

The authors have produced a book which should be read by all those interested in the subject of measles. The use of convalescent serum is particularly complete, and rightly so, as the authors have made notable contributions to the literature. Indeed, the phenomena of blanching of the measles rash after the intradermal injection of convalescent serum (corresponding to the Schultz-Charlton reaction in scarlet fever) is known as the Debré phenomenon after one of the authors of this treatise. The book is simply written. Numerous diagrams and tables of statistics are included. The bibliography is fairly complete, especially with regard to the work of French observers. This work should appeal to those engaged in public health work and administration.

TROPICAL SURGERY AND SURGICAL PATHOLOGY.

By K. K. CHATTERJI, F.R.C.S.I., Major I.T.F. Medical Corps. London: John Bale, Sons and Danielsson, Ltd. 1927. Pp. 244. 16*s*.

IN many respects surgery in the tropics does not differ materially in methods or execution from the art as practised elsewhere. Tropical surgery, covered by this book, is a much more limited field, and the fact that "Surgical Pathology" has been chosen for the subtitle indicates that due attention is given to the life-history of those parasites to which tropical surgery, *sensu stricto*, is due. Major Chatterji's book deals mainly with surgical conditions produced by two important parasites—the *Entamœba histolytica* and the *Filaria bancrofti*—and he has dealt with both in an able manner. His descriptions of operative procedure and his knowledge of the underlying pathological conditions have been culled from quite an exceptional first-hand experience. Hepatic amœbiasis, as experienced in India, is a much more complex subject than a superficial acquaintance of liver abscess as met with in Europe would indicate, while under filariasis quite a number of conditions are described which have remained unrecognised by the writers of text-books of tropical medicine. Other sections worthy of comment are those on the tropical granulomata and the surgical effects of snake-bite, while the instructions for the preparation of saline injections for cholera and the methods of administration are clear and precise. A number of statistical appendices and a useful bibliography are included. This book contains many original ideas and methods; the author's apparatus, the simultaneous aspiration and irrigation of obstinate hepatic abscess, and his methods of injecting the ethyl esters of margosic acid in filarial hydroceles and cysts are noteworthy. Copious illustrations are given; to the Western eye the coloured plates are lurid and terrifying, but they are all original and clear. A few curious slips might be amended in future editions. The statement (p. 39) that the phrenic nerve arises from the brachial plexus is inappropriate in a surgical work, nor do microfilariæ become "chitinised" in the hydrocele wall.

This is a book which should be read by every operating surgeon in the tropics; it must be considered as a solid contribution to Indian surgery.

NERVOUS AND MENTAL DISORDERS FROM BIRTH THROUGH ADOLESCENCE.

By B. SACHS, M.D., Consulting Neurologist to the Mount Sinai and Montefiore Hospitals, New York; and LOUIS HAUSMAN, M.D., Instructor in Neuro-anatomy, Cornell University Medical College. London: Humphrey Milford, Oxford University Press. 1926. With 110 illustrations and three plates. Pp. 861. 50*s*.

THIS elaborate text-book on the nervous and mental diseases to which children and young people are subject has grown out of that older treatise, on the same topic, which was written by the senior author of the present volume when neurological conceptions were considerably different from what they are to-day. "New" diseases have made their appearance, and principles of approach to neurological problems are now oriented more from a physiological than from a morphological aspect. Verbal descriptions of disease symptoms do not suffice; questions of pathogenesis and of ætiology have assumed greater importance, and we hear more of reactions to injurious agents or of biological responses to extrinsic or intrinsic stimuli than formerly. In respect of so-called functional disorders the growing-point of neurology has altered materially in the course of the last 20 years. Changes of these kinds are reflected in the volume under review, yet the essentials of careful clinical observation must always remain. The chapters on encephalitis, poliomyelitis, extrapyramidal disease, endocrine disorders, may be selected as representing the embodiment of recent acquisitions to knowledge, and as conveying to the reader in a discriminating way such data as have been proved to have abiding significance. Special interest attaches to the fifth part of the book, which deals in a sane and critical fashion with modern ideas in respect of the neuroses and psychoneuroses, as well as the psychoses, and contains a chapter on the normal child that is certainly not out of place in a text-book of disease, but is, on the contrary, as desirable as a section on neurophysiology.

Good bibliographies at the end of each section, and good illustrations, contribute to the excellence of this latest volume on neurological pediatrics.

MENTAL GROWTH AND DECLINE.

By H. L. HOLLINGWORTH, Ph.D., Professor of Psychology in Barnard College, Columbia University. London and New York: Appleton and Co. 1927. Pp. 396. 10*s*.

Dr. Hollingworth writes for the general student and handles his subject practically. An example of his methods is the statistical testing of the belief that the only child is prone to emotional instability, and he shows that among college students at least there is no appreciable difference telling against the only child. But he overlooks an inconsistency in his statistics when on page 30 he says that the degree of intelligence exercises a determining influence on the nature of neurotic complaints. He quotes Tendler's figures in support of this thesis, and on the next page gives his own figures which, on examination, show an influence in the opposite direction. Matthew's questionnaire is a useful guide to the elucidation of emotional instability in children, though to classify results on the bare *yes* or *no* answers to written questions invites neglect of personal observation. Indeed, spurious simplification rather mars the book.

Unconscious processes are ignored by the author, and even if this is done for the sake of his readers there is little excuse for the omission of essential details from the account of Rivers's case of claustrophobia; no mention is made of the forgetting of the early experience so fully described by Dr. Hollingworth, or the revival of the memory and the disappearance of the phobia.

The jacket inscription says, "Never before has such a survey of the origin, course, and destiny of human life been undertaken in a single volume and in terms of established psychological knowledge." The book certainly does give an account of human behaviour from the intra-uterine life of the individual to the development of social institutions, with explanation and comment that are not beyond the scope of the general reader.

NEUROSYPHILIS.

La Syphilis Nerveuse. By A. SÉZARY, Physician to the Hôpital Broca. Paris: Masson et Cie. 1927. Pp. 208. 3*s.* 4*d.*

WITHOUT pretending to cover the whole ground, Dr. Sézary has written a series of what may be called essays in neurosyphilis, distinguished by the value of their subject matter as well as by a logical presentment and an easy and readable style. Among these we have found the one devoted to the pathogenesis of parenchymatous neurosyphilis particularly useful; the arguments for and against the hypothesis of a neurotropic virus are marshalled and in turn discussed, and a definite conclusion unfavourable to the theory reached. An essay on diffuse multilocular syphilis disposes of the view that there is more than a superficial resemblance between it and disseminated sclerosis. We think Dr. Sézary sound in his contention that the meningeal reactions accompanying parenchymatous neurosyphilis are effects rather than causes. The chapters dealing with prophylaxis and treatment are equally enlightening and informative.

On the whole, this is an excellent contribution to a subject of constant interest, and one to which we take pleasure in directing the attention of the neurologist and syphilologist.

NOUVEAU TRAITÉ DE MÉDECINE.

Publié sous la direction de MM. les Prof. G.-H. ROGER, F. WIDAL, et P.-J. TEISSIER. Fascicule IX., *Affections du Sang et des Organes Hæmatopoiétiques.* Paris: Masson et Cie. 1927. Pp. 802. F. 80.

THIS represents one of the most important additions to standard works on hæmatology made in any language in recent years. The general conception is admirable, and its execution has been placed in the hands of men all of whom have in various ways been responsible for advance in our knowledge of the blood and its diseases. The edifice of the volume is firmly based upon the rock of morbid anatomy; the sections dealing with therapeutics have obviously been edited with judgment and discrimination. The references show that the authors of every section have brought their material fully up to date, and have, moreover, taken ample cognisance of work done in other countries. It is true that the crow of the Gallic cock is heard occasionally, as when M. le docteur Aubertin attributes the advance in the knowledge of pernicious anæmia since the time of Ehrlich to "l'impulsion de l'école française," but it is not unduly strident.

English and American authors are chidden for their confusion of splenic anæmia of the Banti type with splenic hæmolytic anæmia. Dr. Aubertin and Dr. Léon themselves lapse in their omission of the familial type of splenic hæmolytic anæmia from their classification. Apart from this omission the section is admirable. On the other hand, the section on the lymphadenomatoses contributed by Dr. Clerc must be termed unsatisfactory. It is true that lymphadenoma and the lymphatic affections in general offer one of the most involved and obscure problems in medicine, but to attempt to consider such fundamentally diverse conditions as lymphadenoma of the Hodgkin type, multiple myelomatosis of the Kahler type, chloroma, myeloid sarcoma, and mycosis fungoides all under the same head can only lead to even worse confusion. The section on the purpuras contributed by Dr. Pagniez and Dr. le Sourd is one of the best in the book. It provides the first serious effort we have seen to bring together all the recently won knowledge on the nature and functions of the blood-platelets and their rôle in purpuric conditions. The section on chlorosis by Dr. Aubertin and Dr. Mouquin, though containing no new matter, is a masterly presentation of the subject. Altogether an admirable work.

AN INTRODUCTION TO THE THEORY OF STATISTICS.

Eighth edition, revised. By G. UDNEY YULE. London: Charles Griffin and Co. 1927. Pp. 420. 12*s.* 6*d.*

THIS text-book is so well known, and its merits have been so widely recognised by the attainment of an eighth edition, that our duty is discharged by commending it to all who want to acquire a working knowledge of statistical methods. And this is an increasing number in the medical profession, seeing how much to-day not only the figures of population and of disease incidence but those of pathological findings and of therapeutic results are relied upon for the formation of definite conclusions. The misuse of such figures is rampant among laymen, and many of our own profession are betrayed into statements about averages and means which persuade them to make general deductions, where even a superficial acquaintance with the theory of statistics would make them wary. In defence of medical men, it should be pointed out that statistics, as far as they concern the medical profession, form a particularly perilous weapon of argument. For the quantitative data must always be affected by a multiplicity of causes. The enthusiastic employers of statistical methods, when their significance has not been appreciated, are responsible to-day for a great many loose beliefs among the public, who rely unguardedly upon bold declarations having medical authority behind them but based upon no scientific familiarity with the employment of figures.

A SYNOPSIS OF HYGIENE.

Second edition. By W. WILSON JAMESON, M.A., M.D., Lecturer on Public Health, Guy's Hospital, M.O.H., Hornsey; and F. T. MARCHANT, Senior Assistant, Department of Hygiene, University College. London: J. and A. Churchill. 1927. Pp. 514. 18*s.*

THE first edition of this book appeared six years ago; the work has now been brought so well up to date that it is practically a new text-book. It covers in 11 chapters the subjects of meteorology, water-supplies, removal and treatment of waste matters, ventilation, heating and lighting, housing, food, personal hygiene (including matters pertaining to maternity and child welfare), epidemiology, vital statistics, sanitary law, and chemistry and physics. Two appendices contain much useful information. We have failed to detect any serious errors or omissions. In a future edition some discussion on the importance of disinfection might be added to the description of various methods of disinfecting, and the desirability of spacing beds in dormitories or barracks in order to prevent the spread of cerebro-spinal fever should be stressed. The last entry in the table of factors on page 491 requires to be corrected. Throughout the book the reader is referred to recent articles either in current medical literature or in Government publications dealing with the aspect of public health under consideration, and is thus made to connect his text-book knowledge with current practice. Altogether an excellent book which can be highly recommended to teachers and students of public health.

QUANTITATIVE ANALYSIS.

By J. BARKER SMITH, L.R.C.P. London: Imperial Press. Pp. 16. 1s.

IN this small monograph the author provides simple and rapid methods for estimating various constituents in foods, alcoholic beverages, silk, coal, urine, and other substances. Evidently an enthusiast, he has removed the difficulties inherent in such work by ignoring them entirely, with the result that those for whom the pamphlet is intended would in many cases be unable to distinguish the reliable methods from those which are of doubtful accuracy. To the qualified analyst the work offers several suggestions, which with further development are likely to prove of value, and those interested in quaint expression will fully appreciate the text.

JOURNALS.

JOURNAL OF PATHOLOGY AND BACTERIOLOGY. Vol. XXX., No. 2. Pp. 185–512. April, 1927.—Experimental Pneumococcal Septicæmia and Anti-pneumococcal Immunity, by H. D. Wright (London).—Observations on Trypanosomiasis of Rabbits and its Natural Mode of Transmission, by H. A. Channon and H. D. Wright (London). *Trypanosoma nabiasi* is common in wild and rare in hutch rabbits; it produces no ill-effects; the animals cure themselves of the infection and are thereafter immune. Infection can be propagated by infected blood, but without any great certainty; rabbit fleas work more precisely and appropriate experiments lead the authors to conclude that rabbits get the disease naturally by eating infected fleas.—Variant Colonies of *Staphylococcus aureus*, by J. W. Bigger, C. R. Boland, and R. A. Q. O'Meara (Dublin). The colonies are by no means always typical; many are white instead of yellow and may also be abnormal in consistence and colony-shape. The variations are to some extent inherited.—A New Method of Preparing Staphylococcal Hæmolysin, by the same authors. Very active preparations are obtained by emulsifying agar growths in saline and centrifuging.—On the Pseudohæmolytic Streptococci isolated from the Sputum in Pulmonary Tuberculosis, by W. M. Cumming (Glenlomond). Sputum generally contains streptococci which are hæmolytic on primary blood-agar plates; some of these are genuine hæmolytic strains, but in the majority the broth cultures will not dissolve red corpuscles; serologically this *S. pseudohæmolyticus* is quite distinct from the recognised forms, though it is not homogeneous.—Phenol and Tricresol Effects in Toxin-Antitoxin Solutions, by C. G. Pope (Beckenham). In a very interesting study of the effects of temperature on the mutual solubilities of water phenol and serum proteins it is shown that freezing may lead to such a separation of strong phenol as will destroy the properties of proteids and, as antitoxin is destroyed more readily than toxin, lead to Schick mixtures becoming poisonous.—Benign Polyp of the Œsophagus of Great Size, by S. C. Dyke (Wolverhampton). A monstrous mass extending from the level of the cricoid into the stomach.—Some Uncommon Tumours, by C. Powell White and C. E. Brunton (Manchester). Sixty-four micro-photographs from 26 cases of tumours which are rare or remarkable in one way or another.—The Effect of Heat on the Agglutination of Bacterial Emulsions, by A. N. Goyle (London). Technical discussion of the effect of heat on the different agglutinable substances in typhoid and Gaertner bacilli.—The Value of Different Kinds of Antigen in Prophylactic Enteric Vaccines, by J. A. Arkwright (London); we comment on this paper elsewhere (p. 883).—The Effect of Ultra-violet Rays on the Rous Chicken Sarcoma, by C. F. W. Illingworth and G. L. Alexander (Glasgow). The filtrable agent which causes the sarcoma survives a longer exposure to ultra-violet light than common bacteria. The radiation of filtrates does not differentiate between the "virus" and the "specific factor" of Gye.—Periodic Examinations of the Streptococci of the Human Throat, by the late C. Iris Fox and D. M. Stone (London). Any one throat maintains its dominant type of streptococcus over long periods; catarrhs are associated with the appearance or increase of hæmolytic forms.—The Influence of Cultural Conditions on the Production of Diphtheria Toxin, by A. F. Watson and E. Langstaff (Beckenham). Those who make diphtheria toxin for the preparation of antitoxin on a large scale often have great difficulty in ensuring a satisfactory product. It is shown here that the materials from which the culture medium is made, its heating in sterilisation, and the access of air during growth are important factors, but others evidently exist and are at present beyond constant control.—Observations on Lamb Dysentery, by T. Hare and E. E. Glynn (Liverpool). This disease often kills a quarter of the lambs in the north of England and south of Scotland in the first five days of life. Its occurrence is very puzzling and cannot be closely related to anything in the mother. Crowding increases its prevalence. The authors suggest that it is essentially akin to melæna neonatorum with perhaps a secondary bacterial infection.—The Use of Wild Rabbit Serum in the Laboratory, by W. M. Cumming (Glenlomond). Better than that of tame rabbits.—Scrotal Cancer in a Tamil employed on Antimalarial Oiling, by A. N. Kingsbury (Singapore). A fresh example of oil cancer.—The action of *Bacillus typhosus* on Milk, by C. Gorini (Milan). With specially stimulative media milk is first peptonised and afterwards clotted.

Reports and Analytical Records.

COW AND GATE MILK FOOD.

(WEST SURREY CENTRAL DAIRY CO., LTD.)

IN our issue of Feb. 19th last we published an analysis of this food obtained by the employment of the Rose-Gottlieb method; this gave the fat content at a lower figure than was claimed by the West Surrey Central Dairy Company, and as it now appears rightly claimed. The company having pointed out that the well-known method used in our analysis could only be expected to give satisfactory results with liquid milks, the further analyses, whose results are set out below, were put in hand, the Werner-Schmidt method being now employed. It will be seen by the figures in the new analyses that the statements of the manufacturers with regard to the fat content in Cow and Gate Milk Food are justified. The following are the results of two analyses:—

	No. 1. Per cent.	No. 2. Per cent.
Moisture	2·94	2·83
Ash	5·98	5·93
Fat	26·62	27·20
Proteids	27·85	26·46
Lactose	36·40	37·05
Total	99·79	99·47

The analyses indicate that the samples of dried milk examined have been prepared from full cream milk of good quality with no addition.

We regret that in the previous report a product, which we have on former occasions commended to the favourable notice of our readers, should have been misjudged.

THE TUBERCULOSIS SOCIETY.—The annual meeting of this society was held on April 8th at Somerville College, Oxford. The following were elected officers for the ensuing year: President: Sir StClair Thomson; Chairman of Council: Dr. Roodhouse Gloyne; Council: Dr. Gloyne, Dr. G. T. Hebert, Dr. H. Gordon Smith, Dr. A. Neville Cox, Dr. C. J. Faill, Dr. H. A. Ellis, Dr. F. R. Walters, Dr. A. Sandison, Dr. E. Ward, Dr. G. M. Mayberry, Dr. G. B. Price, and Dr. Jane Walker; Hon. Secretary: Dr. F. J. C. Blackmore; Hon. Treasurer: Dr. W. Brand.

THE LANCET.

LONDON: SATURDAY, APRIL 23, 1927.

DOCTORS AND LEASEHOLD REFORM.

WHILE the Government, Landlord and Tenant Bill was being given a second reading, two speakers commented on its mission to give protection or relief to the professional classes and in particular to the medical profession. The first of the three parts into which the Bill is divided proposes to allow a tenant compensation both for any improvements he has made and for any goodwill which he or his predecessors in title have built up at the premises in carrying on a trade or business. But this part of the Bill applies only to leasehold premises used wholly or partly for carrying on a trade or business; premises where a profession is carried on are expressly excluded. Criticising this exclusion, Mr. HUGH DALTON observed that there are many doctors, dentists, and other professional men who are just as liable as anyone else to suffer from a landlord's confiscation of their improvements or of the goodwill with which they have endowed the premises during their tenancy. He instanced particularly the doctors in the poorer parts of London who have built up practices and, when their leases come to an end, must either pay a grossly excessive rent or be turned into the street. This complaint perhaps requires remedy rather through the Rent Restriction Acts than through the Landlord and Tenant Bill, but it is serious. Dr. GRAHAM LITTLE spoke of the consultants largely inhabiting a particular district of London, who should be given the benefit of the Bill, and also of the general practitioners who in some cases have been obliged to build on leasehold premises in order to comply with the National Health Insurance Act requirements in the matter of waiting-room accommodation and so on. Mr. A. MACLAREN said that professional goodwill was assessable in the case of probate duty or when a practice passed from one doctor to another. There is a good deal of substance in his contention that a man may knock at a door in Harley-street with some confidence that the practitioners inside have a particular reputation. Professional men have endowed the Harley-street neighbourhood with its special rental value, a fact which the Bill does not sufficiently recognise. Replying at the close of the debate, the Solicitor-General expressed sympathy and hinted that the Bill could be amended in Committee. Two years ago the Finance Act extended to the professions the income-tax concession in respect of the wear and tear of plant and machinery which had previously been granted to trades and businesses. A similar extension is required in the Landlord and Tenant Bill. In the second part of the Bill, which contains general amendments of the law of landlord and tenant, there is no discrimination against the professional classes. The chief proposal here is that which prevents the landlord from unreasonably withholding consent if a tenant wants to assign or sublet the premises. The law courts already have favoured the tenant in the interpretation of covenants upon this point; Parliament proposes to go further.

Our ancestors would be surprised to see the extent to which the Rent Restriction Acts and the present proposals interfere with the contractual relationship of landlord and tenant. They might equally be surprised at the high rents now charged to professional men, at the herding of several consultants in a single house like the congregating of barristers upon a stair-case in the Inns of Court, and at the system by which the lessee of a house, by subletting rooms to other doctors, can sometimes manage to live rent free—a system which cannot but suggest to the lessor that he might fairly raise the rent of the house a little higher. It is an open secret that those who prepared and approved the Government's Bill found it difficult to interfere with the law of leaseholds without initiating a disturbance of the rights of ownership which might have had far-reaching consequences. They therefore proceeded with great caution. One feature of the Bill, the handing over of disputes to referees appointed by Reference Committees, has been criticised as multiplying the occasions for litigation. It is also criticised by the legal profession itself, which does not particularly love the creation of new tribunals which grew up towards the end of the war. But the county courts which otherwise would furnish the proper forum for the decision of landlord and tenant questions are swamped by the flood of cases which the Workmen's Compensation Act, the Rent Restrictions Act, and other statutes let loose upon them. It is possible that the new tribunals will be efficient, but a tenant may well find that what he saves from the clutches of his landlord he will surrender to the clutches of the lawyers.

TYPES OF RESPIRATION.

WE publish in this issue the third and last of the Lumleian lectures on the Muscular Mechanism of Respiration and its Disorders by Sir CHARLTON BRISCOE, whose previous work on disorders of the thorax and its contents is sufficient to ensure him a respectful hearing. The subject is one on which anatomists and physiologists have already spent much time and labour, but the Lumleian lecturer shows us that there remain problems for investigation which, although they may at first sight seem of small importance, are yet nearly as weighty as they are difficult. The muscular mechanism of forcible respiration is pretty well understood and the numerous muscles which may take part in it—they include in fact a majority of all those of the body—have had their rôles assigned to them as muscles of inspiration or of expiration; but Sir CHARLTON BRISCOE deals with more elusive phenomena and confines his attention to quiet respiration. His prolonged and patient investigation of the action of the diaphragm led him to inquire into the mechanism of respiratory movements and of pain and dyspnœa arising in respiratory muscles. Two types of respiration have long been recognised, the thoracic and the abdominal—or as the lecturer prefers to call it, the diaphragmatic, from the preponderant action of that great muscular mass in the latter type. After eliminating as far as possible the confusing influences of those muscles

which are concerned in maintaining the posture of the body as well as taking part in respiration, it was possible to study the details of the process clinically in man as well as experimentally on the lower animals—this latter research being undertaken by Lady BRISCOE. It is interesting to find that Sir CHARLTON BRISCOE rejects the long accepted view that the abdominal muscles are of great importance in respiration owing to their supposed action in pushing up the diaphragm during expiration, although he acknowledges their help in thoracic respiration. In quadrupeds the diaphragm is almost the only muscle active in quiet breathing, and although the conditions are different in man, in him also this muscle is credited with doing most of the work, aided, however, by the active contraction or postural tonus of others. Sir CHARLTON BRISCOE holds the view, however, that if exaggerated, these actions "are not a normal use of muscle but an abnormal over-use, and in consequence a possible source of trouble." The muscles of thoracic and those of diaphragmatic respiration may even in certain circumstances be antagonistic and so hinder each other's action. Various causes, which are specified, may result in enhanced and persistent tonus in certain muscles, notably the scalenus anticus and that obscure and often ignored structure, the triangularis sterni. The lecturer considers that the long maintenance of postural tone leads to pain and tenderness owing, as he thinks, to the fact that, in the absence of alternate contractions and relaxations of muscle-fibres, the contents of the veins are not duly squeezed out nor the arterial supply facilitated. In the musculature of the lower limbs and the vertebral column no such symptoms are observed to follow the prolonged maintenance of postural tone in everyday life, and more information would be welcome as to the conditions necessary for their appearance in the muscles concerned in thoracic respiration.

If the hypothesis be accepted that the diaphragmatic type of respiration is normal in orthograde man as well as in pronograde quadrupeds, and that the thoracic type is abnormal and out of harmony with man's evolution, it is easy to understand that such an improper use of muscles might give rise to pain and symptoms. It may be asked, however, whether, in assuming the erect position, man has not so radically altered the conditions of respiration as to render doubtful the aptness of an analogy between him and his four-footed ancestors—if indeed his descent is to be traced through quadrupedal and not quadrumanous forbears. As Sir CHARLTON BRISCOE has pointed out, the assumption of the erect position relieved the thorax of the duty of transmitting the weight of the head and forepart of the body through the forelimbs, and so gave the thoracic muscles much greater freedom to act in respiration. In conditions so profoundly altered it would surely not be unnatural for a change in the type of respiration to occur without the production of unpleasant symptoms. The lecturer does not advocate a return to a pronograde posture and four-footed progression, although he thinks that it may be useful as an exercise for children, just as a well-known German surgeon advocated and employed his "crawling" method in the treatment of scoliosis. But if we accept it as established that in certain cases the habit of thoracic respiration throws overworked muscles into tonic spasm, it may be conceded that such a fixation of the thorax, even if incomplete, may hinder the action of the diaphragm and at the same time become obnoxious to the patient through the sensation of pain either direct or referred. Sir CHARLTON BRISCOE has found that by pushing the lower ribs towards the pelvis such symptoms may be relieved, and that re-education of the diaphragm is possible, with the help if necessary of mechanical means, such as strapping the lower chest, or better still, constriction with a narrow webbing belt. By one or both of these procedures he has succeeded in relieving symptoms arising in quite a variety of disorders. Among these were cases of neurasthenia, disorderly action of the heart, tachycardia, gastric pain, the pain of pleurisy and of pleuritic adhesions, obscure chest pain on exertion, dyspnœa, persistent basal bronchitis, chronic influenzal bronchitis, nocturnal retrosternal pain and anxiety, and even asthma. The nature of some of these complaints, and their diversity or identity of symptoms, must arouse reflections as to the importance of suggestion in the relief of pain of obscure origin; but whatever part it may have had in the cases reported by Sir CHARLTON BRISCOE, the fact remains, and is to be reckoned with, that a number of sufferers have been relieved of more or less distressing symptoms. We hope that other clinicians will follow the teaching and in appropriate cases try the effect of the method of treatment which he has described.

OPHTHALMIC BENEFIT.

A Departmental Committee is sitting to consider the Optical Practitioners (Registration) Bill which has been read in the House of Commons for the first time and to make recommendations. This Committee will benefit by the wide range of experience possessed by its medical members, Dr. H. B. BRACKENBURY, Mr. E. TREACHER COLLINS, and Dr. C. O. HAWTHORNE. The correspondence on this subject which has been appearing in these columns for many weeks past displays well enough the conflicting views of prescribing opticians and ophthalmic surgeons. The prescribing optician claims to be better qualified for the work of testing the refraction than the average medical man and as well qualified for it as the average ophthalmic surgeon. To ensure this high standard they propose that a register of opticians should be established which should include only those possessing special qualifications which in the future are only to be granted to those who have undergone a technical training lasting three years, and including experience at special "refraction" hospitals. At present the fee for testing allowed by those approved societies that send their members to opticians is 5*s*. and as presumably these highly trained "optometrists" will be content with this fee, it follows that the approved societies, and through them their members, will reap the benefit of the difference between 5*s*. and 21*s*. under which latter fee the ophthalmic surgeon is not willing to do this work. The opticians further maintain that the number of medical men qualified to do this particular work is insufficient for the demand which will be made if the work is given to them alone. They also point out that in the past the bulk of this work has, as a matter of fact, been done by opticians; and they regard the ophthalmic surgeon, inasmuch as he claims to do refractions for everyone, as something of an interloper.

The ophthalmic surgeon's case may be put shortly thus. The average general practitioner does not undertake this work. The ophthalmic "panel"

consists only of such as have had special experience in eye work, and includes a large number of those who practise ophthalmic surgery exclusively (Mr. ADRIAN CADDY in his letter says "practically all," but we believe this to be an exaggeration). There is no evidence to support the contention of the opticians that the number is insufficient and there is every reason to suppose that the supply will increase with the demand. The prescribing of spectacles cannot be done with complete satisfaction except by those who have a knowledge of the body as a whole—i.e., by medical men and women. The advisability or otherwise of wearing glasses is in certain cases a matter which requires considerable judgment and cannot be decided solely by reference to the amount of refractive error. Moreover it is not a matter which can safely be left to the decision of those whose interest it is to push the sale of glasses by every possible means. Diseases of the eye are frequently dependent on diseases affecting the whole body. The claim made by opticians that they are as well able to diagnose a normal fundus by the ophthalmoscope as the ophthalmic surgeon can hardly apply to the great majority of opticians at present. Those who go through the three years' course and obtain admission to the proposed opticians' register will form a limited body of men who, while nominally only concerned in the prescription and supply of glasses, are not very likely to be content with that. As they will necessarily have to diagnose many cases of disease and abnormality other than refractive errors, the tendency will be for them to occupy the position of an inferior and partially trained body of oculists.

Hardly enough attention seems to have been paid to the point of view of the insured patient. For him the question is whether, when his eye troubles him, he would rather see a man capable of diagnosing and treating any possible cause of the trouble or a man who is admittedly capable of dealing with only one of the possible causes. He will not, we think, be much troubled by the propaganda on cigarette cards which will enable the "mere child" to arbitrate between doctor and optician.[1] Undoubtedly what the patient wants is to see the best possible man, even if this means a rather larger fee to be paid by his society. Possibly the solution might be found in the direction of an option given to the patient himself; in order to get the best possible advice he might be willing to pay the extra fee involved in a consultation with an ophthalmic surgeon out of his own pocket when his society declines to do this for him. In any case it is essential that the privilege of choice of oculist from among the existing panel be more effectively brought to his notice than is the case at present with many of those societies that have already adopted the scheme of the Ministry of Health with regard to ophthalmic benefit. This is the more necessary in that whereas opticians can and do advertise, ophthalmic surgeons do not. Mr. ADRIAN CADDY suggests that the list of names on the ophthalmic panel should be available to the public in the post offices. Certainly all practitioners on the ordinary panel ought to have it. If at the same time the body which controls the names to be included in the ophthalmic panel could be made more authoritative the whole matter would be in the way of reaching a satisfactory basis.

[1] The Optician and Scientific Instrument Maker, March 11th, p. 38.

Annotations.

"Ne quid nimis."

GLASS FRAGMENTS IN PRESERVED FOOD.

WHETHER food is better preserved in metal or glass containers has not been finally decided; there is much to be said on both sides. Glass has steadily been growing in public esteem on account of its cleanliness and honest transparency, but metal containers facilitate sterilisation and are more easily rendered air-tight. Dr. Gerald Leighton, a medical officer of the Scottish Board of Health, went carefully into the matter a few years ago.[1] Glass has now its advocate at the British Ministry. It is not uncommon to see in the press accounts of the discovery of particles of glass in foods and beverages sold in glass containers, and sometimes the paper adds a comment on the dangers of this method of packing. Now and then an action is brought against a firm of provision merchants for injury caused by glass fragments that have become mixed with the food. Glass containers are so widely used to-day that any danger that may exist must threaten great numbers of people, and the Ministry of Health have rightly ordered an inquiry into the matter. The report[2] of the investigating officer will amply reassure those who have been anxious lest their jam, lunch tongue, or bottled beer should contain a sufficient quantity of glass to do them any harm. Evidence in this country of injury from swallowing glass is extraordinarily rare; the four largest London hospitals denied having seen a case in five years. Moreover, powdered glass seems to be less noxious than is popularly supposed. It has enjoyed great notoriety in tales of Eastern life as a slow poison, but according to all the testimony quoted in Dr. Hancock's report it is readily enveloped by the food in which it is concealed and by the secretions of the stomach and intestine. Sharp-edged and angular fragments of appreciable size may cause damage, but these are hardly ever present. The largest particles are found in jam—3/8 in. × 5/16 in. was the biggest—but although microscopic glass is present in most samples it is much too small and scanty to do any harm. Strangely enough, the actual container is the least considerable source of glass particles. It is generally made of very good material, and Dr. Hancock's analysts were rarely able to trace any of the glass they found to the jar or bottle in which they found it. Semi-automatic processes produce safer vessels than hand processes. The commonest ways in which glass gets from the container into the food are the use of returned empties, some of which have jagged rims; the neglect of proper inspection during washing and filling; and the failure to observe precautions when containers are suddenly subjected to a high temperature, as when boiling jam is poured into them. There is considerable risk of glass contamination in sweet (and therefore sticky) mineral water, for the breakages are 1 or 2 per cent., and fragments are liable to stick to the rubber pad which surrounds the orifice of the rotary filler. Unless these are wiped off they may get into the next bottle. Bottles are generally "sighted" for glass before they are passed for sale. The commonest source of glass particles is the dust of the factory, which contains not only glass but vitreous slag. The report is illustrated with some interesting microphotographs of samples prepared by Dr. F. Monier-Williams, of the Ministry of Health Laboratory. They show how the crossing of the Nicol prisms on the polarising microscope blots out the glass fragments while allowing the sand or crystal to remain visible. Provided manufacturers use good glassware and exercise proper care little danger need be feared from glass-packed foods, but these conditions are essential to public safety.

[1] THE LANCET, 1923, i., 1118.

[2] Reports on Public Health and Medical Subjects, No. 37. By George C. Hancock, C.B.E., M.R.C.S. Ministry of Health. H.M. Stationery Office. 1927. 1s.

HUMAN POLAR BODIES.

Prof. A. F. Dixon, of Dublin, has at last found a satisfactory polar body of a human ovum. Some years ago Prof. Arthur Thomson described what was probably a polar body in a woman's ovary, but the specimen was badly fixed and did not completely satisfy the histologists. The fundamentalists will be discomfited. They may be content that man should share his superfluity of naughtiness with mosquitoes, mandrils, and mammoths, but it must be very disappointing to have one assurance after another that he has not invented some peculiar mechanism of heritable reproduction known to himself alone, but proceeds along cytological lines of the most familiar type. Anyone who is much more than momentarily interested in Prof. Dixon's paper in the *Irish Journal of Medical Science* for April may well feel a little ashamed of himself; for if he is deeply moved by the discovery it means either that he is grossly anthropocentric or that he does not really believe in evolution. As most of us look at everything from our own point of view, and as our faith is often weak, many will read the account and Prof. Gatenby's comment with considerable attention.

THE EPIDEMIOLOGY OF CHOLERA: A NEW CONCEPTION.

THE significance of a difference of serological behaviour in organisms which are indistinguishable from one another in shape or in conditions of culture has long been a matter of dispute among pathologists. The typing on serological lines of pneumococci and meningococci has not led to such striking clinical results as was at one time hoped; the agglutination tests carried out on the comma bacillus or vibrio of Koch, however, seemed to have a definite bearing on the pathogenicity of the vibrios. At one time it appeared likely that the pathogenic bacilli alone showed specific agglutinability, and that those not possessing this power were not true cholera vibrios, though in every other respect indistinguishable from them. Further investigations revealed the fact that sporadic cholera is very constantly associated with non-agglutinating vibrios. A further complication is that no chronic carriers of agglutinating vibrios can be demonstrated, though spontaneous outbreaks of epidemic cholera have been observed to occur in many places where no history of immediate infection from any outside source can be obtained or be reasonably inferred. A new conception of the epidemiology and endemiology of cholera was put before the Indian Science Congress, held at Lahore, in January of this year, by Dr. J. W. Tomb and Captain G. C. Maitra. They have since published their theory,[1] with a detailed account of the observations which led them to their conclusions. In the first place, they observed that during the dry hot weather in the Asansol Mining Settlement vibrios were very numerous in the ponds or ground tanks frequented by the inhabitants of the Settlement for washing after defæcation. When washing in these tanks was prohibited the vibrios gradually diminished in number and always disappeared after 12 to 14 days. Efforts to isolate vibrios from the stools of those frequenting the tanks being a complete failure, the observers concluded that the ordinary peptone enrichment process for isolating vibrios from solid stools was unsatisfactory and after much experiment they devised an "open-bowl" method of cultivating vibrios from stools.[2]

By means of this method they have been able to prove that in many parts of the mining settlement 35 per cent. of the inhabitants are chronic carriers of non-agglutinating vibrios, though they have confirmed the absence of carriers of agglutinating vibrios noted by other workers. The suspicion that agglutinability was a variable characteristic led to efforts to convert the non-agglutinating into the agglutinating types. These proved inconclusive, but the reverse process was more encouraging. Agglutinating vibrios in cholera stools permanently changed en masse after 12 to 14 hours into the non-agglutinating form when inseminated under natural conditions in a ground tank. Laboratory cultures of Koch's vibrios changed into the non-agglutinating form only after 24 to 36 hours. Dr. Tomb and his colleague suggest that agglutinability is mainly an artificial property developed and fixed by laboratory cultivation. Examination of the stools of epidemic cholera convalescents showed that 80 per cent. of these convalescents became chronic carriers of non-agglutinating vibrios, the agglutinating form permanently disappearing from the stools within two to four weeks. It has been a matter of common observation that during epidemics (due to agglutinating vibrios) non-agglutinating vibrios invariably appear in great numbers in contaminated water supplies, the non-agglutinating vibrios disappearing pari passu with the disappearance of the epidemic.

Dr. Tomb and Captain Maitra conclude that the non-agglutinating vibrio (which is itself capable of causing clinical cholera) takes on the agglutinating characteristic under certain biochemico-physical conditions in the human intestine, the nature of which are at present unknown, and that this mutation or epidemic form is the cause of epidemic cholera. Non-agglutinating intestinal vibrios in their opinion constitute the reservoir of cholera, both epidemic and endemic. The theory is developed that the endemicity of cholera in any locality depends primarily upon the existence in the community of great numbers of (healthy) carriers of non-agglutinating vibrios; secondly, on the occasional conversion in the intestines of a proportion of these carriers—by some vital process—of the non-agglutinating vibrio into its mutation form the agglutinating vibrio; thirdly, upon the widespread and continued pollution of drinking water supplies with this mutation form through the unhygienic habits and customs of the people; and fourthly, upon the capacity of vibrios to persist or multiply in the drinking water supplies of the locality owing to climatic conditions, a vicious circle being thus established. When once therefore cholera has been introduced into a community in widespread epidemic form, great numbers of chronic carriers of non-agglutinating vibrios remain—apparently for years—amongst whom cholera of the sporadic or the epidemic type may occur at any time; moreover, if drinking water supplies are habitually contaminated by the people then cholera will become endemic, provided that the climatic conditions are suitable for the survival and multiplication of vibrios. On the contrary, where wholesale pollution does not occur, or where conditions are unfavourable to the persistence of vibrios in the drinking water supplies, cholera cannot become endemic; if epidemic outbreaks occur, they "fizzle out," as they are reported by Colonel Gill ordinarily to do in the Punjab during the hot dry weather.[3] Dr. Tomb and Captain Maitra predict that in the deltaic area of Bengal vibrios will be found to persist or multiply in the surface water supplies at the two periods of the year only when cholera is ordinarily epidemic there. On the other hand, in the dry and arid regions of North-Western India the epidemic season of cholera is in general confined to the rains, since only during that season is there the necessary amount of surface water, as well as the necessary temperature (associated with the insanitary habits of the people) to make an epidemic of cholera possible. Where the percentage of chronic carriers of non-agglutinating vibrios remains small, spontaneous outbreaks of cholera will be infrequent, and in such areas cholera, if it occurs at all, will be chiefly an imported disease. The observers have been unable to ascertain by experiment whether or not the agglutinating vibrio immediately after it has lost agglutinability is still capable of conveying

[1] Indian Medical Gazette, vol. lxii., No. 2, February, 1927.
[2] Ibid., February, 1926, p. 56, and November, 1926, p. 537.
[3] Gill, C. A.: Indian Medical Gazette, January 1926, p. 1.

epidemic cholera, but from combined observations in the field and laboratory they conclude that the vibrio is capable of conveying cholera for some time after agglutinability has been lost, and a probable instance of this kind has been recorded by Chalmers and Waterfield [4] as having occurred in Gindha. An additional factor, therefore, in the spread of epidemic cholera is the period of time which has elapsed between the contamination of drinking water with the agglutinating vibrio and its ingestion as a non-agglutinating vibrio by non-immunes.

THE BEHAVIOUR OF APES.

THAT useful and interesting journal, the *Quarterly Review of Biology*,[5] so brightly edited by Prof. Raymond Pearl, in Baltimore, does not seem to be as well known in this country as it should be, especially among busy professional men who like to keep in touch with biological progress. The first number of the second volume contains, among other notable reviews, a summary account by Dr. R. M. Yerkes and Miss M. C. Child of what is known of the psychology and behaviour of the anthropoid apes which will help those who visit the Zoo on Sunday afternoons to orientate and arrange their interests, perhaps to contribute to the analysis of the ways of animals. It is only in the last 15 years or so that serious attempts have been made to study the orang, gorilla, and chimpanzee in detail. It has been done partly in captivity and experimentally, partly in the open where Mr. T. A. Barns and Mr. Benjamin Burbridge have made particularly valuable contributions under conditions in African forests which must necessarily be difficult. There is much of interest about the animals' special senses: their sight, for instance, seems to be separated by a wide gap from human vision, and Mrs. Kohts had some trouble to make sure that chimpanzees can differentiate colours at all. Some of the most notable observations have been made by Dr. W. Köhler at the anthropoid station at Teneriffe; he thinks it is certain that the chimpanzee exhibits a degree of intelligent behaviour which in man would pass as evidence of insight and reasoning calculation. Of language proper they have none. Emotions have corresponding vocal expressions, and the sounds may possibly represent racial feelings or ideas but never those of the individual.

THE PULSE-RATE IN DIPHTHERIA.

IN the February issue of the *New Zealand Medical Journal* Dr. I. M. Allen describes his observations on the variations of the pulse-rate in diphtheria in a paper based on the study of 132 consecutive cases. He distinguishes three forms of pulse curve. In the first, which was found in the mild uncomplicated cases, the fall in the pulse-rate occurred on the same day as the fall in the temperature or on the day following. In the second form the pulse remained rapid for some days or fell at a longer interval than usual after the fall of temperature. This form was usually found when antitoxin treatment had been delayed and was regarded by Dr. Allen as indicating (*a*) increased elimination; (*b*) stimulation; (*c*) increased protection by the injection of more antitoxin. The third type of pulse curve was characterised by a fall below normal after the fall in temperature, until the tenth to the sixteenth day when it rose by 20 or more. This secondary rise, which occurred in 50 cases, or in 40 per cent. of the series, persisted from a few days to six weeks and was attributed by Dr. Allen to intoxication of the heart muscle. Unlike most clinicians, Dr. Allen is inclined to regard the local condition of the throat as of little value in forming a diagnosis, as he found that 60 per cent. of his cases could not be diagnosed in this way. He maintains that a faucial condition accompanied by a comparatively low temperature and a high pulse should be suspected to be diphtheria and treated accordingly. The relation of the variations in the pulse-rate to prognosis is next considered, the occurrence of a secondary pulse rise unless of short duration being generally regarded by him as a grave sign. Early treatment by subcutaneous or intravenous injection—sufficient doses of diphtheria antitoxin combined in cases of mixed infection with antistreptococcic serum—is recommended, but, strange to say, no mention is made of the intramuscular route which many authorities regard as the most desirable in the treatment of diphtheria.

[4] Jour. Roy. Army Med. Corps, August, 1918, p. 161.

[5] Quarterly Review of Biology. London: Baillière, Tindall and Cox. Yearly, about 600 pages. 23s. 6d.

SYNTHETIC THYROXIN IN USE.

WE noted a week or two ago [1] the Harrison award by the Chemical Society to Dr. C. R. Harington for his brilliant isolation of the active principle of the thyroid gland, leading to the synthesis of an iodised tyrosine derivative with similar properties. The *Edinburgh Medical Journal* for April publishes a report of the striking results obtained in two myxœdematous subjects with a synthetic thyroxin prepared by Dr. Harington and Prof. G. Barger. The metabolic activity of both patients increased immediately and rapidly, by 26 per cent. in one case and 48 per cent. in the other, after doses of 14 mg. each. This gives figures of 1·85 per cent. and 3·43 per cent. per mg. compared with the 2·8 per cent. of the Mayo workers using natural thyroxin. Corresponding rises in temperature and pulse-rate and decreases in weight accompanied the rise in basal metabolism. Synthetic thyroxin should be more dependable than the crude thyroid in use to-day, and cheaper than the active principle isolated from the gland.

ANTITYPHOID VACCINATION.

IT has generally been assumed that dead typhoid bacilli are more efficient as vaccines if they are killed as gently as possible and in particular with as little heating as is possible. In the last number of the *Journal of Pathology and Bacteriology* Dr. J. A. Arkwright suggests that this idea needs reconsideration and that the variety of the bacillus is much more important than the details of the preparation of the vaccine. He worked chiefly with four variants of *B. paratyphosus* A and less fully with the similar forms of *B. typhosus*. He distinguishes forms which grow in smooth colonies and are motile, those that grow in rough colonies and are non-motile, smooth non-motile, and rough motile varieties. Smooth variants, whether motile or not, are much more virulent than rough forms. The antigen associated with flagella and present in smooth and rough motile forms is destroyed by heat and therefore can have little effect on virulence. On the other hand, the antigen which resists boiling is found in both the smooth forms and is absent from both the rough forms—i.e., it is associated with virulence. Following this out by dosing guinea-pigs with vaccines made from the different variants and then testing the resistance of the animals to intraperitoneal inoculation of live cultures, he finds that smooth motile and smooth non-motile forms make efficient vaccines, while both the rough forms are of relatively little value; and that smooth vaccines are at least as effective after being boiled as after being killed with the minimum of heat. Hence the heat-resistant element in the bacilli is the important prophylactic agent. The confusion has arisen largely from so many of the previous observations which were intended to be germane to the question having been made by measuring antibodies in the blood rather than actual resistance; experimenters have assumed that antibodies were a measure of immunity and have shirked the trouble or been unable to face the cost of direct tests of resistance. Using ordinary cultures, containing various and unknown assortments of the variants which are now

[1] THE LANCET, April 2nd, p. 719

being sorted out, the agglutination test as usually performed measures the agglutinins which are developed in response to the heat-labile element in the bacilli, the part of the antigen, that is, which is now found to be unimportant. Dr. Arkwright's discovery may well open up a new and fruitful field in vaccination. It needs confirmation; his data are numerically not altogether convincing, and would hardly satisfy the criticisms of the bacteriologists' way of dealing with statistical problems which were made by Prof. W. W. C. Topley in his Harben lectures.[1] His test doses, too, were very large and perhaps poisonous rather than infective. But he has certainly made out a case which is worth hopeful prosecution. And until some provision is made for the study of the botanical bacteriology which ought to be able to tell pathologists all they want to know about variants and races of bacteria, it will rest with the pathologist to work out this extremely important question of variation as well as to apply the results to medicine.

INFLUENZA AS AN ENTITY.

WRITERS on influenza often express doubt whether any such disease really exists or whether the infinitely various symptom-complexes which are thus described by clinicians are not in fact unrelated. Since we do not know the nature of the responsible organism, the doubt is legitimate and salutary. There is, however, a good case to be made out for the clinical unity of the conditions which are given the general name of influenza or *grippe*. In their deductions from a recent big epidemic in Germany, H. Taterka and M. Landsberg[2] classify the disease into five forms according to the depth at which the respiratory tract is invaded; these are the severe toxic, the pharyngotracheal, the bronchitic, the broncho-pneumonic, and the pneumonic. The clinical evidence which they adduce supports the view that the diverse symptoms are due to a single organism, acting at different levels, and associated with kinds of secondary infection. The local inflammatory symptoms are to be interpreted, as in all infective processes, as evidence of resistance, and the fulminating or "severe toxic" form is that which occurs when immunity is so low that little local resistance develops. A reaction at the pharynx produces nose-bleeding, sore-throat, and persistent cough; at the bronchial level it produces bronchitic and asthmatic symptoms; whilst in the lungs it produces pneumonia, with a large range of characteristic complications. One of these is an infiltration which may be present without febrile symptoms and persists for a long time; another is a fibrinous pleurisy rarely seen in non-influenzal broncho-pneumonia. Dry pleurisy is often, because of its painfulness, the most conspicuous symptom. Pulmonary abscess, gangrene, interlobular empyema, pleurisy with serous and hæmorrhagic exudate, induration and the outbreak of tuberculous lesions are also fairly common complications. Nervous symptoms have been reported; for instance two French writers[3] recently described a cutaneous hyperæsthesia, which they have noticed in constant association with the tracheal form of influenza. The skin of the face and head and sometimes of the shoulders becomes very painful, the lacrymal secretion is increased, the sense of taste is lost, and the pulse-rate rises considerably. These symptoms point, fairly certainly they consider, to an infection of the trigeminal and upper cervical nerves, simultaneous with infection of the mucosa.

Whatever organisms are concerned in its causation, many authorities, like Rudolf Jaffé,[4] are satisfied that influenza may be safely diagnosed on pathological and anatomical changes in the respiratory tract alone. Not only, he says, are the local changes highly characteristic—e.g., the formation of pseudo-membrane in the lower part of the trachea—but the whole picture is such a motley that no other disease can produce anything to compare with it. This is especially true when the lungs are involved. The frequent coexistence of apparently unrelated symptoms may be due to the various secondary infections which are present in most cases of influenza, and their very presence is often sufficient to settle the diagnosis.

[1] Jour. State Med., vol. xxxv.
[2] Med. Klinik, 1927, i., 389.
[3] Bull. de la Soc. Méd. des Hôpit., March 24th, p. 1866.
[4] Med. Klinik, March 25th, p. 427.

A FRANCO-BRITISH ANATOMICAL CONGRESS.

A JOINT meeting of the Association des Anatomistes and the Anatomical Society of Great Britain and Ireland was held during last week in the Institute of Anatomy at University College, London. The Association, represented by the President, Prof. A. Brachet, of Brussels, and about a hundred members, with their wives, were met at a reunion at the University of London Club, Gower-street, by Prof. G. Elliot Smith, the President, and members of the Anatomical Society, on April 10th. A full programme of about 120 communications and demonstrations occupied the time of the actual joint meeting, which extended over the next three days. The morning and afternoon sessions had crowded audiences and were carried on under the chairmanship of the two Presidents. The communications, which were for the most part of a highly technical nature, will appear in due course in the special journals of the various countries to which their learned authors belong. It remains to be said that the austerities of scientific congress-making were relieved on the social side, where already the visiting ladies had been put under the advisory care and guidance of a small ladies committee. The Zoological Society threw open its gardens to the visitors on April 11th and the Tower and Hampton Court received them on other days. A conversazione was held at University College on the evening of the 11th, when the fascinating exhibits were completed by the rendering of some charming songs by Miss Carey Foster. On April 12th a reception was given at the Wellcome Museum of Historical Medicine in Wigmore-street, and was largely attended. On April 13th the visitors were entertained to dinner by the Anatomical Society in the senior common room at King's College. On the following day many members of the Association availed themselves of Prof. J. T. Wilson's invitation to visit Cambridge and see something of the work of the schools of medicine there. During the whole period of the Congress there was an excellent exhibit of anatomical appliances, models, and books.

REST HOMES FOR RHEUMATIC CHILDREN.

THE Metropolitan Asylums Board decided at its last meeting to provide further residential accommodation for the treatment of London children suffering from rheumatic diseases, subject to the sanction of the Ministry of Health. This is to be done by extending Queen Mary's Hospital for Children, Carshalton, to the extent of 350 beds, in addition to the unit of 60 beds primarily intended for research purposes which were set apart at the beginning of last year. Consideration was given to utilising the admirable country site at Copthorne, near East Grinstead, purchased in 1914 for the erection of a sanatorium, but this proposal was negatived on account of the high cost of installation where no public services are already laid down. The new accommodation will be for children of both sexes under 16 years of age suffering from subacute rheumatism, the later stages of acute rheumatism, rheumatic chorea, or rheumatic carditis including recurrent attacks. It is admitted that there are in London not less than 10,000 children who have suffered or are suffering from rheumatic symptoms, and in a recent report to the London County Council Dr. F. N. K. Menzies stated that there are from 600 to 700 children absent from school for long periods on account of rheumatism, representing in fact some 25 per cent. of chronic invalidity amongst school-children. The experiment of sending these children

to ordinary convalescent homes has not proved successful; the parallel between the problem of the rheumatic and tuberculous child is fairly close and admission to recovery homes requires a careful basis of selection. The urgency of a rapid expansion of accommodation in such rest homes or hospital schools has been emphasised by the Subcommittee on Rheumatic Heart Disease in Children, appointed by the British Medical Association, whose second report[1] has just appeared, and in this report the policy of concentration is advocated. Each city, it is suggested, should seek to develop a kind of hospital suburb or colony at the best site available, and part of this development would be the hospital school or rest home which should provide for the rheumatic child treatment as long as may be necessary in the best possible environment. This policy is now likely to have its fulfilment for London at Queen Mary's Hospital, Carshalton. In the meantime, until the necessary building is completed, 56 beds at High Wood Hospital, Brentwood, are to be allocated temporarily for the treatment of these children.

SILICOSIS AND THE HOUSES OF PARLIAMENT.

A LAG is inevitable between the discovery of facts and their practical application. Fifteen years have elapsed since the intimate association was recognised between inhaling silica dust in industry and a subsequent tendency to succumb to pulmonary tuberculosis, but in this country no definite campaign has been undertaken to abolish the silica dust risk, and with it one not inconsiderable group of deaths from tuberculosis. So pronounced is the lag that we find the Government, through its Office of Works, embarking upon a contract, costing between three and four millions sterling and extending over some years, for refacing the Houses of Parliament with a free-stone (Stancliffe stone) well known to generate toxic silica dust when worked. The masons employed both at the quarry and on the buildings will be exposed to considerable risk.

When the matter was raised in debate, the position was held that it was unreasonable to suggest that, while everyone else should be at liberty to use this particular type of sandstone, the Government should deny themselves the use of what was considered the most suitable and the best wearing stone that could be found for the purpose they had in view. But surely the duty of Government should be first to set an example itself, and subsequently to interdict the use of so dangerous a stone. The Ministry of Health spends ever more public money in its anti-tuberculosis campaign, and yet another Government Department chooses in the interests of architecture, it would appear, to expose a section of the community to risk. Even from an æsthetic point of view the stone in question has little to recommend it for this purpose. When it is used in an industrial atmosphere such as that of London, it turns a dull heavy black, which causes the onlooker to regret rather than to derive satisfaction from its lasting properties. The Office of Works promises to take all precautions for the health of those engaged; the nature of the precautions are not stated. Even if the new dust traps[2] for pneumatic tools could be adapted for stone carving, the masons appear determined not to use them. Anyway the decision to use the stone was arrived at before any such palliative had been tried out. It will be interesting to hear whether the Office of Works propose to adopt the preventive measures of the Miners' Phthisis Medical Bureau of South Africa, and to extend to the workmen about to be exposed to this unnecessary risk the provisions of the Workmen's Compensation (Silicosis) Act, 1918. Is it not possible, however, even at this late stage, to ask the architects to confer again, in the hope that some less dangerous material could be sought? Portland stone was good enough for refacing Buckingham Palace.

[1] Brit. Med. Jour. Suppl., April 16th, 1927.
[2] THE LANCET, 1926, ii., 344.

The Services.

ROYAL ARMY MEDICAL CORPS.

Capt. J. W. Pell to be Temp. Capt., and temporarily relinquishes the rank of Capt.

J. W. Dowzer to be Temp. Lt.

TERRITORIAL ARMY.

C. F. Mayne, late Surg.-Lt., R.N., to be Capt.

ROYAL AIR FORCE.

E. J. T. McWeeney is granted a short service commission as a Flying Officer for three years on the active list.

Flight Lt. (hon. Squadron Leader) F. E. Wilson resigns his temporary commission.

INDIAN MEDICAL SERVICES.

The awards of brevets in peace-time is sparingly made and the honour is highly prized in the army. The latest recipients of this distinction are: Lt.-Col. A. Spitteler, Commanding the Indian Station Hospital at Loralai, and Lt.-Col. J. Norman Walker, the Viceroy's Surgeon.

Dr. Jamadar Abdur Rahim has been appointed Vice-Consul at Birjand in addition to his medical duties at Birjand Dispensary. Lt.-Col. M. MacKelvie has been appointed Civil Surgeon, Dacca, on return from leave. Maj.-Gen. T. H. Symons, Surg.-Gen. with the Madras Government, has resigned his seat on the Council of State. Maj. S. D. Bilimoria has been appointed Asst. Dir. of Public Health, Ambala Circle, on transfer from the Military Department. He relieves Lt.-Col. C. A. Gill, Asst. Dir. of Public Health, who has been holding this charge in addition to his other duties. Maj. K. R. Batra has been appointed Civil Surgeon, Kangra, relieving Maj. H. Chand. Lt.-Col. Baird, civil surgeon, Allahabad, has been appointed Inspector-Gen. of Civil Hospitals, United Provinces. Lt.-Col. Godfrey Tate, Inspector-Gen. Civil Hospitals, United Provinces, has been appointed Surg.-Gen., Bengal, vice Maj.-Gen. R. Heard. Lt.-Col. G. Hutchison officiates as Inspector-Gen. of Civil Hospitals and Prisons, Assam. Lt.-Col. C. R. O'Brien has been appointed Civil Surgeon, Mymensingh. Capt. S. N. Hayes has been appointed Professor of Midwifery, King Edward Medical College, Lahore, and Superintendent, Temporary Maternity Hospital, Lahore, vice Lt.-Col. R. G. Bott. Lt. G. A. Hill, Asst. Dir. of Public Health, Punjab (Technical) Epidemiology, has been appointed Asst. Dir. of Public Health, Ambala Circle. Dr. C. W. B. Normand has been appointed to officiate as Dir.-Gen. of Observatories, Delhi. Lt.-Col. B. R. Dennis officiates as A.D.M.S., Bombay District, vice Col. Lloyd on leave.

ROYAL MEDICAL BENEVOLENT FUND.—At the last meeting of the Committee 43 cases were considered and £563 voted to 39 applicants. The following is a summary of some of the cases relieved.

Daughter, aged 60, of M.R.C.S. who died in 1894. Has supported herself as a housekeeper until recently, when her mother's ill-health obliged her to give up her post. They live in one room at a rent of 10*s.* a week, the joint income amounting to £94 per annum. Fund voted £24.

Widow, aged 61, of M.D. Durh. who died in 1910. Married only nine months when her husband died. Has supported herself by nursing and taking boarders until last year, when, owing to ill-health, she was obliged to give up flat; now lives in a bed-sitting-room at a rental of 10*s.* a week. Receives £22 from investments and gifts amounting to £75. Voted £24.

Widow, aged 36, of M.R.C.S. who was killed in an accident last year. Left with two children aged 7 and 2½. Asks for temporary help until her late husband's estate is settled. She is resuming her nursing and hopes to be able to manage later to support herself and children. Voted £20.

M.D. Durh., aged 70. Married. One son, who is allowing his father £5 a month. Has only made £50 from locums this last year, and was taken ill in June. Through the kindness of a friend was given £150 for his own and wife's expenses and now asks for help during convalescence. Voted £15.

Daughter, aged 60, of M.R.C.S. who died in 1899. Applicant and her sister left business some years ago to look after their aged mother. To meet expenses they let part of their house and also took boarders. Joint income: investments, £22; boarders, £129; letting, £70. Mother had Old Age Pension and an Epsom Pension. Rent and rates amounted to £75. Voted £26.

Subscriptions may be sent to the Hon. Treasurer, Sir Charters Symonds, at 11, Chandos-street, Cavendish-square, W.1.

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CCXX.

TREATMENT OF VARICOSE ULCER.

Varicose ulcers owe their characteristics to the faulty circulation of the blood through the limb on which they occur. The dilated and inelastic veins allow the venous blood to stagnate and the defective blood flow causes malnutrition of the limb. The subcutaneous veins are generally most diseased and, therefore, the skin and subcutaneous tissues suffer most, but the whole limb is affected to a greater or less extent as is shown by loss of tone of the muscles and ligaments and excess of extravascular fluid. In uncomplicated cases of varicose veins this defect of the circulation is only present when the foot is below the level of the pelvis; when the patient is horizontal, or the foot raised, the venous return is not impeded and there is a good circulation in the limb.

The faulty nutrition of the limb predisposes to indolent ulcer in two ways: (1) The skin becomes more susceptible to injury and infection. (2) The process of repair is hindered. When an injury occurs, and sometimes without a visible wound, the skin becomes inflamed and phlebitis and lymphangitis cause occlusion of the vessels and still further impairment of the circulation. There is no direct connexion between the extent of the varicose veins and the susceptibility to varicose ulcer. A patient may have large varicose veins and yet maintain a good enough circulation to keep the skin healthy, while a patient with little apparent varicosity may have serious malnutrition of the skin. Phlegmasia alba dolens and thrombosis of the femoral veins may lead to lesions that are indistinguishable from varicose ulcer.

When an ulcer has appeared secondary changes are set up. Septic infection occurs in the skin and surrounding tissues and they become hard, œdematous, and inelastic; cicatrisation, the extent of which depends upon the severity of the septic infection, leads to further impairment of the circulation and delay in healing. Long-standing and improperly treated ulcers may cause these secondary changes to affect the skin and subcutaneous tissues of the whole circumference of the limb and to extend from the knee to the foot. The infection may spread through the deep fascia by the veins and lymphatics causing adhesion of tendons to their sheaths, myositis, periostitis and occlusion of the deep vessels, and trophic changes in the foot. Varicose ulcers are not, as a rule, painful. Pain is generally a sign of phlebitis or inflammation under the deep fascia.

Varicose ulcers have to be distinguished from indolent ulcers occurring in a scar which is surrounded by healthy skin; infective ulcers such as those due to syphilis, tubercle, &c.; ulcers associated with disease of the underlying bone, and carcinomatous ulcers which are generally, but not always, due to malignant changes in an old neglected varicose ulcer.

Preventive Treatment.

All patients with varicose veins should sleep with their feet raised above the level of the pelvis. This is most easily effected by placing under the mattress a skeleton wooden wedge the same width as the bed, seven inches high at the bottom and increasing to nothing at the level of the patient's hips. Such a wedge can be easily made of wooden laths fastened to two triangular pieces of wood. No other treatment is needed, unless there are signs of defective circulation such as atrophy of the skin, œdema after standing, and loss of tone of muscles and ligaments. If these signs be present the patient should be advised to lie with the feet raised for an hour in the middle of every day, and to wear a support such as crepe bandages or a well-fitting elastic stocking reaching from the toes to half-way up the thigh. The stocking should be made in two parts, one reaching from the toes to the tubercle of the tibia, and the other from the middle of the thigh far enough down to overlap the upper edge of the lower part. If the stocking is in one piece it constricts the veins about the knee during movements of the limb. The support should be put on each morning before the leg is put out of bed—i.e., before the veins become distended with blood.

Small Early Ulcers.

Any graze, pustule, or inflammation of the skin, no matter how apparently trifling, should be regarded as serious if it occurs in a limb that shows signs of defective circulation. The patient should be advised to lie up entirely with the foot raised until the lesion is healed. The sepsis should be treated with warm boric compresses, which should be always moist and not applied too hot, the skin being easily injured by heat. When the ulcer is clean it should be covered by a dressing that does not require changing too often. Even the most careful dressing tends to damage the newly formed epithelium. Unna's paste, to which 1 part in 16 of boric acid or 1 part in 8 of balsam of Peru has been added, is a very satisfactory dressing. In these small ulcers it does not need changing more than once a week; the ulcer will generally heal in a fortnight.

When the ulcer is healed it is advisable for the patient to lie up for a further week or more, according to the size and thickness of the scar, and during this time gentle massage, vibro-massage, and radiant heat (not more than 180° F.) are valuable aids to getting a healthy scar. When the patient gets about again the preventive treatment outlined above should be carried out. It is not advisable to perform any of the many operations on the veins that have been suggested. None improves the circulation in the limb and many make it worse.

Large or Chronic Ulcers.

In these cases the secondary changes referred to above are always present. For this reason the methods of treatment that would be applied to large and chronic ulcers elsewhere are not applicable. If the ulcer be excised its site will still have the imperfect circulation that is the initial cause of the condition; and for the same reason sliding flaps and tube grafts give unsatisfactory results. The treatment should be directed to prevent further impairment of the already defective circulation by extension of infection, and to promote rapid healing with minimal scar formation. The patient should rest with the foot elevated, warm boric compresses being applied until the ulcer is clean and the erythema has subsided. This does not generally take more than a few days and then, if the granulations are bright red and healthy in appearance, healing can be hastened by covering the surface of the ulcer with Thiersch grafts, which should be taken from the arm rather than the thigh, the blood-supply of the latter often being impaired. The grafted ulcer can be covered with a dry gauze bandage, which should not be moved for five or six days. When the grafts have taken Unna's paste or a mild antiseptic dressing should be applied, and not changed more often than necessary.

If the ulcer be very slow in cleaning or if the skin at its edge forms a hard dense fibrous ring, the granulations are generally purple in colour and pulpy and unhealthy in appearance. Such an ulcer may be curetted and the fibrous ring removed. To do this properly an anæsthetic is necessary, and all the tissue down to the deep fascia should be removed. Boric compresses are then applied until healthy granulations form, and these may then be covered with grafts. This method of treatment takes a long time, often many weeks, and it is only successful in a proportion of the cases in which it is tried. Healing may be hastened by ultra-violet radiation, given as a graduated general body bath; during the period of cleaning

the ulcer concentrated local applications of ultra-violet radiation may be given, but only minimum doses must be given since the poorly nourished skin readily vesicates.

The patient should be kept at rest after the ulcer is healed, and the scar treated in the same way as those of small early ulcers. Freedom from recurrence depends largely on the length of rest after healing and on the care with which after-treatment is carried out.

Intractable Ulcers.—If the ulcer has been present or recurring for many years and is situated in a large area of discoloured indurated skin, and particularly if the deep structures have been affected to such an extent that the ankle is almost fixed, it is often not worth while to undertake the many months treatment necessary to heal such an ulcer. The resulting scar breaks down almost as soon as the patient gets up, and returns to the same condition as when treatment was started. Such ulcers should be treated by the ambulatory method, the object then being to prevent them from getting worse rather than to persuade them to heal.

Amputations.—In cases in which suppurative phlebitis has occurred below the deep fascia and the ankle is fixed by matting of the surrounding structures, it is often impossible to get the ulcer clean, and no treatment will obviate the necessity of frequent dressings. The inconvenience of this and the crippling resulting from the deformity may be so severe as to make amputation necessary. It should be performed through the lower third of the thigh; the badly nourished tissues below the knee make a poor stump.

Ambulatory Treatment.

Patients are often unable to lie up for the time necessary to heal a varicose ulcer. There is then always a serious risk of development of the secondary changes above referred to, even if they are not already present. It is difficult to impress on patients the seriousness of what appears to be a slight graze or septic spot, but they must be made to understand that it is only by prolonged and careful treatment which they themselves must conscientiously carry out, that they can be spared a lifelong disability. The preventive treatment outlined above should be adopted and the ulcer cleaned by boric compresses — a long week-end in bed is a great help in doing this. Unna's paste should then be applied from just above the malleoli to the tubercle of the tibia (no matter how small the ulcer may be) and this should be changed about once a week. Crepe bandages or an elastic stocking should then be put on over the dressing.

Note on the Application of Unna's Paste.

Zinc and gelatin paste of the B.P.C. (commonly called Unna's Paste) is often wrongly applied. The container should be stood in water just warm enough to melt it (about 100° F.), and a bandage three inches wide prepared of a roll of white gauze four layers thick, or of soft crinolin quite free from starch or dressing. The ulcer to be dressed should be clean, and the skin around should be washed and dried by a spirit lotion which should be allowed to evaporate. The part to be covered should then be painted with a thick coat of the jelly, by means of a brush or cotton-wool swab, and immediately covered by a single layer of the bandage, which must be evenly and firmly applied. It should be applied firmly enough to make the jelly bulge through its interstices, and to avoid creases and ridges in the bandage it may be cut into lengths as often as necessary as it is bound on. Another thick coat of jelly is applied and then another layer of bandage until about six layers are in position. Nothing should be allowed to touch the dressing until it is firmly set. It may then be covered with a light bandage, unless the patient is going to wear a crepe bandage or elastic stocking over it. To remove the dressing it should be saturated with warm water.

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Special Articles.

AN OUTBREAK OF TYPHUS.

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General.

A SMALL outbreak of typhus occurred in Glasgow during the later days of July and the first two weeks of August, 1926, and for several reasons certain of its aspects are worth recording.

The disease has not appeared in epidemic prevalence in this country since the middle of last century, and its gradually diminishing incidence within recent years has given rise to a general impression that the disease is smouldering before total extinction. The low incidence is reflected in the very few references to the disease in recent British medical literature, and what references there are relate chiefly to epidemics in Eastern Europe. Typhus was present in many Eastern European countries during and immediately after the war, and spread as far westwards as Holland, Spain, and Portugal. The distribution of the disease in Britain is interesting, and Table I. shows the number of cases of typhus and the number of areas affected for each year since 1919, when the disease was prevalent in Europe:—

TABLE I.—*Typhus in England (E.) and Scotland (S.) (1919–25).*

—	1919.		1920.		1921.		1922.		1923.		1924.		1925.	
	C.	Aa.	C.	Aa.	C.	Aa.	C.	Aa.	C.	Aa.	C.	Aa.	C.	Aa.
(E.) ..	3	1	—	—	—	—	13	4	1	1	8	1	—	—
(S.) ..	38	4	74	5	1	1	20*	4	2	1	—	—	14	1

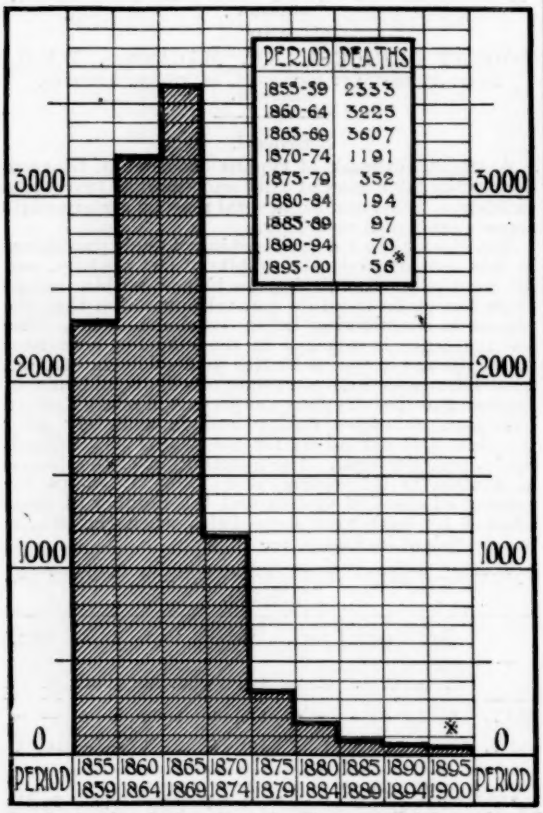
C. = Cases. Aa. = Areas affected.
* This figure does not include an outbreak of typhus in the Isle of Raasay, Skye.

A prominent feature of Table I. is the relatively low incidence of the disease in England compared with Scotland during the years 1919–25 inclusive. Another feature is the distribution of infected areas in those years when typhus was more highly prevalent. In *Scotland*, since 1919 these areas are representative chiefly of the west of Scotland, the majority of cases occurring in Glasgow, Greenock, and Paisley. In 1925 the 14 cases reported were confined to Greenock. Since the outbreak in Glasgow during August, 1926, cases of typhus have been reported from Dumbarton, Port Glasgow, and Stranraer, towns situated in the south-west of Scotland. In *England*, the two outbreaks since 1919 have occurred in the north-western district. In 1922, out of 13 cases reported in England, Birkenhead was responsible for 11 cases. An outbreak in England in 1924 comprised eight cases occurring in St. Helens. It is remarkable that the distribution of typhus during the period 1919–26 has been along the western seaboard of Britain, and with the exception of the outbreak in Skye during 1922, has been confined to the south-west of Scotland and north-west of England. The proximity of these districts to Ireland—a recognised endemic centre of typhus—may explain the appearance of the disease in these parts.

The intimate association of typhus with overcrowding, hardship, and poverty arising from causes such as war or famine has been recognised since early times, but it is now realised that these factors are only contributory to the part played by body

vermin in the transmission of the disease. There exists in this country the mechanism for the spread of the disease, and it would appear that only the infecting virus, whose presence is represented by the above-recorded outbreaks, is necessary to produce an epidemic of the disease. The early clinical recognition of the disease and a full appreciation of the part played by body vermin in the transmission of the infection are the important factors in the control of typhus.

FIG. 1.



Graph showing typhus fever in Glasgow. Total number of deaths in five-yearly periods from 1855–1900. Six years are included in the period indicated by an asterisk.

So few are the cases occurring in Britain that many medical practitioners are unacquainted with the clinical manifestations of the disease. In addition, sporadic cases of typhus, like other infectious diseases—and notably cerebro-spinal fever—are atypical and lead to difficulties in diagnosis, the disease tending to breed true only in epidemic periods. These facts suggest sufficient reason for publishing the following notes, for the undiagnosed or missed cases of typhus is frequently the cause of the appearance of the disease in epidemic proportions. The outbreak in Glasgow was confined to eight cases, and five of these were admitted to hospital before the development of the rash, two others on the first day of the rash. It was therefore possible to study the disease from its earliest stages, which permitted of a complete and detailed survey of the clinical features. Certain important laboratory investigations were also carried out.

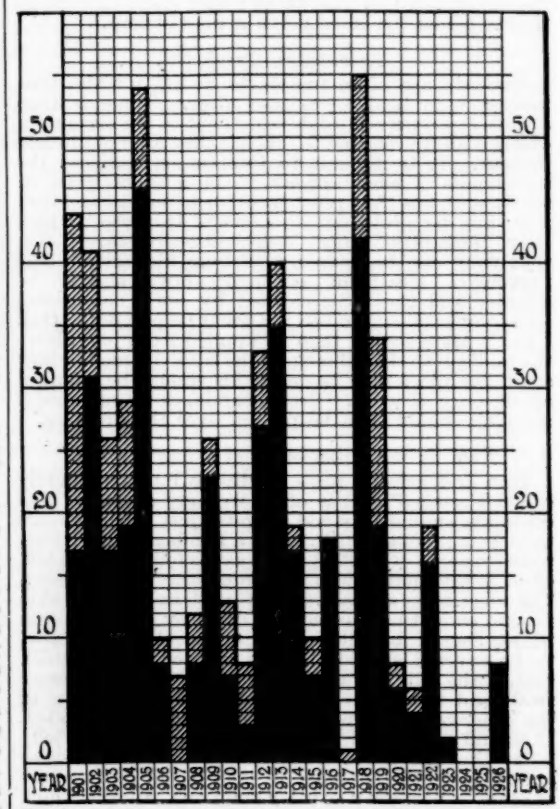
History of Typhus in Glasgow.

In 1818 Glasgow—a manufacturing city of 145,000 inhabitants—experienced its first great epidemic of typhus. The disease reappeared in epidemic prevalence in 1837, 1847, and in 1851–52. After the last of these epidemics there was a period during which the disease declined in the city, and admissions for fever to the Royal Infirmary in 1859 were fewer than in any of the preceding 35 years, notwithstanding the enormous increase in population during that period. Reliable statistics relating to typhus are available since 1855, and the history of the disease in the city since that year may be divided into two parts—namely: (1) 1855–1900, and (2) 1901–26.

(1) (1855–1900).—While the actual numbers of cases occurring during the earlier years of this period are not known, accurate statistics of deaths from typhus since 1855 are available. The figures form a fairly accurate picture of the incidence of the disease since that year, and the deaths are shown in five-yearly periods on Fig. 1. This graph shows a definite and sustained diminution of the incidence of the disease in the city.

In the 'sixties of last century the whole "Sanitation" energy concentrated on a struggle with typhus, and hospital accommodation was first provided by the municipality as a counter attack to the ravages of the disease. In 1865 the first Municipal Fever Hospital was established for the isolation of cases of typhus, and from Fig. 1 it will be seen that following the quinquennial period 1865–69 a definite reduction in incidence of the disease occurred. This reduction was not wholly due to the isolation of the patient, but also to the administrative measures taken to prevent overcrowding, which resulted in a higher standard of personal and domestic cleanliness. Typhus had therefore occurred in extensive epidemics in the city during the nineteenth century, although for the last 25 years of that century the disease showed no tendency to assume large epidemic proportions.

FIG. 2.



Graph showing cases of typhus fever in Glasgow for years 1901–26. Grouped cases indicated in solid black.

(2) (1901–26).—During the period 1901–26 the disease continued to show a low incidence in the city,

and on Fig. 2 the *actual cases* occurring in each year are represented. It is necessary to explain that the city extended its boundaries to include adjacent burghs in 1912, so that the incidence of the disease after that year is calculated on a much increased population and is not comparable to the incidence preceding that year. Until 1924 typhus was endemic in the city, but during the years 1924 and 1925 no known cases of the disease occurred in Glasgow. The period of freedom of the city from this infection was actually longer than two years, for the two cases registered in 1923 occurred in January of that year, whereas the 1926 outbreak occurred in August—i.e., three and a half years afterwards. In the graph (Fig. 2) the grouped cases are shown in black, whereas sporadic cases are represented by shaded areas. A group of cases consisted of two or more cases associated with one another. The highest number of cases occurring in one group was 14 during the year 1918. Each black area on the graph may represent several small groups of cases; for example, in 1910 there were two groups of infection in April followed, not until four months later, by isolated single cases in districts widely separated; in 1912, of the 43 cases registered, 23 occurred in four separate foci, but in the same group of streets. These outbreaks were no doubt interrelated, although inquiry failed to demonstrate any association. Later in this year there occurred cases in three families not associated with the former cases or with one another; in 1913 six areas in different parts of the city were affected, four of which were found to be associated. In the case of two areas there was no connexion, although there was the suggestive fact that the original case was a dealer in old clothes; and, in 1918, there were eight groups of cases occurring at different periods throughout the year. The first group consisted of 14 cases in the same district and spread over a period from the end of January to the end of March of that year. These eight groups of cases occurred in different parts of the city.

In the specific years mentioned above typhus occurred in small groupings of cases at different parts of the city and also in sporadic form. Although these years have been mentioned as examples the same picture of the disease presents itself in nearly all the other years forming the period 1901–26. During this period 87 groups of cases occurred in Glasgow, and Table II. shows an analysis of the diagnosis of the first cases in each group:—

TABLE II.

Typhus ..	.. 51	Other diseases ..	9
Enteric fever	.. 22		
Pneumonia	.. 5	Total ..	87

In 36 groups, therefore, the diagnosis of the primary case was missed. The chief difficulty was apparently to distinguish typhus from enteric fever. The nine cases classified in the table under "Other diseases" comprise two cases of influenza, two of scarlet fever, one of nephritis, one of diphtheria, and three notified as "Undefined fever."

History of the Outbreak.

This small outbreak of typhus was limited to eight cases and occurred in one of the lower working class districts of Glasgow. Seven patients, including the first recognised case, were members of the same family, six of whom resided in the same house, the seventh being a married daughter who frequented the house, but lived some distance away. The eighth patient, a friendly neighbour, had nursed the first recognised case prior to his admission to hospital.

The first reported case, G. B., a male, aged 25 years, had been admitted to a general hospital on July 29th, 1926—his eleventh day of illness—with a diagnosis of nephritis. He had a history of headache, joint pains, and a mild delirium of two days' duration. A rash was present on admission and a suspicion of typhus raised. He was transferred to Belvidere Fever Hospital for observation. In this institution he was restless and talkative, with dry furred tongue and an offensive breath due to oral sepsis. The pupils were not contracted and reacted smartly to light and on accommodation, and there was no suffusion of the eyes. The facies did not suggest the "bloated" facies of typhus. There was a generalised petechial rash of a *bright-red* colour with some subcuticular mottling. It was extensively distributed over the trunk, arms, and legs but exempted the face. On the hands and feet it presented a purplish appearance, but even there the elements were discrete. The rash could not be regarded as absolutely typical of typhus and the constitutional disturbance was not in proportion to the extent and intensity of the eruption. Some nuchal rigidity and a slight but definitely positive Kernig sign suggested a meningeal condition. Lumbar puncture gave a slightly turbid fluid under normal pressure, which, when examined, showed an increase of globulin and a cellular exudate consisting more of polymorphs than lymphocytes, but no organism was found. The urine contained albumin but no other abnormal constituent. The case was doubtful clinically, but the Weil-Felix reaction was positive.

When the suspicion of typhus was raised the patient's home was visited.

Two members of his family a girl, aged 18 years, and a boy, aged 10 years, were suffering from headache and malaise; they were removed immediately to Belvidere Hospital for observation. The house of a married sister, aged 25 years, was visited and this woman was confined to bed with headache and a slight temperature. She also was removed to hospital for observation. The remaining contacts from both houses were transferred to a reception house. On July 31st—i.e., the day following the admission of the above four cases to hospital—two sisters of the original patient, aged 14 years and 13 years, were transferred from the reception house to Belvidere Hospital. These children were apparently well, but had developed elevations in temperature. On August 1st another sister of the first case, aged 20 years, a maid in a local hospital, was admitted to Belvidere Hospital with a temperature of 101° F. and an early suspicious rash. One of the numerous contacts kept under observation was admitted to hospital on August 6th with a temperature of 103° F. and a slight rash. This eighth patient was a woman, aged 50 years, who had been in direct contact with the original case, having nursed him before his admission to hospital.

All the above cases showed definite evidence of typhus several days after admission to hospital.

Source of Infection.

Extensive inquiries were made with a view to tracing the source of infection of these cases, but no definite conclusion was reached.

The history of prevous illness in the family revealed a few suggestive circumstances which could not be entirely dissociated from the later appearance of typhus in the household.

The father of the family, aged 50 years, died in a local general hospital on July 16th from an illness whose nature was somewhat obscure. This illness commenced with rigor, headache, and sickness; on admission to hospital on July 5th the patient was semi-comatose and complained of violent occipital headache. There was some rigidity of the neck, contraction of the pupils, and congestion of the face. The reflex responses were sluggish and there was a positive Kernig sign. From the date of admission to hospital to the date of death there was no evidence of rash and no cases of typhus occurred in that hospital. From post-mortem examination the cause of death was certified as "pneumococcal meningitis." In addition, the mother of the family had also suffered, but had recovered from an indefinite illness lasting eight days. During the earlier part of June she had been confined to bed with occipital headache and sickness. A Weil-Felix blood reaction in her case was negative, but this test was performed six weeks after the onset of her illness. There had been no illness in the family antecedent to that of the mother.

It is difficult to dissociate the illness of the father from the definite typhus from which seven of the family suffered.

From an administrative point of view the illness of the father was treated as typhus. No definite information of the deceased father's movements could be obtained. The mother stated that he had been unemployed and had never been away from the district where he lived. The movements of the mother and of the first recognised case did not assist in detecting the source of infection. None of the family had been outwith Glasgow, and, so far as is known, no member had been in contact with a case of typhus. The last known case of the disease in Glasgow occurred in January, 1923, and in another

district of the city. It has been suggested that the virus of typhus may pass through generations of lice and reproduce the disease in the same locus at different times. In this outbreak the infected houses were situated in streets which had not previously been infected. The nearest previous case of typhus occurred in an adjacent street in February, 1922—i.e., four and a half years previously—and there was no association between the family infected in 1922 and the family infected in August, 1926.

Glasgow and Ireland have been intimately related in the history of typhus. In the 1846 epidemic affecting the larger cities of Britain, there is abundant evidence that the disease was imported from Ireland. In 1913 the outbreak in Belfast was associated with the sale of old clothes imported from Glasgow where several cases of the disease had occurred. Again, Greenock has been an endemic centre of the disease for several years. The source of infection in the Glasgow outbreak of 1926 is obscure and has no relationship, at least, to Dublin or Belfast. The last case of the disease in Dublin occurred on April 30th, 1926, and was a contact from a neighbouring urban district, whilst no cases of this infection have occurred in Belfast for several years.

Clinical Notes on Cases.

These notes are a summary of a comprehensive study of eight cases of typhus. The extensive literature on the clinical aspects of typhus in this country deals with the disease as it occurred a decade or more ago. No marked change in type falls to be recorded, but bearing in mind the wide variations in the types of other infections which have occurred in a like period, a brief portrayal of the clinical picture of the present series may not be amiss.

Age.—In the family of seven the ages ranged from 10 to 27, and the eighth case was a woman aged 50.

Sex.—Two of the patients were male and six female.

Stage of Invasion.—The fever was ushered in with rigor and severe frontal headache in two cases. Two other patients complained first of headache, backache, generalised pains, and an "out-of-sorts" feeling not sufficient to confine them to bed for two to three days, while in the two youngest patients the first evidence of infection was an elevation of temperature. The headache and backache persisted during the invasion stage and was frequently accompanied by nausea and sickness. Nervousness amounting to hyper-excitability was noticeable in the younger cases.

Rash.

(*a*) *Description of Rash.*—The rash appeared on the fourth to sixth day of illness, except in one case where it was noted on the second day of pyrexia. It consisted at first of pinkish-red maculo-papules, chiefly intradermal and just appreciable to the finger. One case (M. B., 15 years) had a papular eruption on the wrists and both palmar and dorsal aspects of the hands comparable to the papular eruption of small-pox. The maculo-papules later became more macular and of a larger size with an irregular margin fading into the surrounding skin. The pinkish-red colour of the rash at this stage resembled more the rash of rubella than that of measles. The spots faded readily on pressure, varied in size and shape, tended to become more profuse and confluent on the extremities and back, and remained more discrete and smaller on the abdomen, where the lesions were brighter and stood out well against the whiter background. Later lesions of indefinite outline and more purplish in colour developed in the deeper layers of the skin. Subcuticular mottling aptly expresses this appearance. In the progress of the exanthem there was a gradual recession of the rash into the deeper layers, as shown by the successive stages of papule, maculo-papule, macule and subcuticular lesion.

(*b*) *Colour of Rash.*—The colour varied from bright reddish-pink (maculo-papules) to more delicate pink (macules), while the subcuticular lesions were more purplish in hue. Later the macules became dull reddish-brown, were more injected, and disappeared less readily on pressure. In the more severely ill patients petechiæ developed in the centre of pre-existing macules. The purplish, subcuticular element was best appreciated on the extensor aspects of arms and legs and in the flanks. The rash gradually faded, became dirty brown in colour, showed no tendency to desquamate, and at this stage was difficult to differentiate from the staining of a scarlatinal erythema or other intense eruption. Later, such elements as remained were isolated brownish spots, not unlike freckles. There was a tendency, most noticeable in the milder cases, for the rash to vary in intensity from day to day and even from hour to hour.

(*c*) *Distribution of Rash.*—The papulo-macules were first noted on the abdomen and, scantily, on the chest. Soon after they appeared on the entensor surfaces of the forearms, where the eruption early became quite profuse and was present there even when the rash generally was quite scanty. The rash spread rapidly to the lower limbs, the lesions being most profuse on the buttocks and along the anterior and extensor surfaces of the legs, and in the course of six to eight hours it had covered the whole body, exempting only the face. The areas most extensively involved were the back in the interscapular region and, in the female, the breasts, particularly around the nipples and in towards the axillæ, down the sides, above the iliac crests, and extending laterally towards the lumbar region; on the limbs, the buttocks and extensor aspects of the forearms and legs were most affected. The upper arms, the groins and axillary folds were but little affected when the rash was scanty. This is scarcely in agreement with the usual teaching. In one patient papules were noted on the forehead and neck, spreading over the angle of the jaw to the cheeks.

Relationship of Intensity of Rash to Age and Severity of Illness.—Generally speaking, the younger the patient the less intense was the rash. In the case of W. B. (male, 10 years) the rash was evanescent, lasting only two days, varying in intensity during that period, and leaving very little staining. In J. B. (female, 13 years) the rash was generalised and well developed, but less confluent than in the older patients and tended to fade more quickly with less staining and no petechial elements. The most intense rash was that of the original case who certainly was not the most ill of the patients. In his case the eruption was much brighter and more hæmorrhagic than any of the others and naturally persisted longer. Petechiæ were noted in Mrs. E. R. (female, 25 years) and S. B. (female, 20 years), both of whom were extremely ill. The prognostic value of the hue, brighter in more favourable cases, dusky and purplish in very ill cases, was exemplified in Mrs. McG., the only fatal case, whose rash, although generalised, was never more than a dull purplish mottling. In all cases the rash developed before the Weil-Felix reaction became positive.

Hyperæmia of the Skin.—A striking feature of the cases was a tendency to a sodden, hyperæmic skin, best appreciated on the dependent parts—e.g., on the back—and shown by the marking of the skin by the bed clothes and the presence of large erythematous blotches on pressure points. This hyperæmia was noted by Murchison, and is in contrast to what is found in most other acute febrile conditions.

Advance Stage.—With the appearance of the rash there was greater constitutional disturbance, the temperature reached its highest level, and the patients looked acutely ill. The outstanding feature was great drowsiness and lethargy, particularly noticeable in the younger patients, who, from being comparatively bright and lively, now became absolutely listless and apathetic, and relapsed into their drowsy state as soon as they were left undisturbed. Later, when the rash was fading, there was an amelioration of the symptoms and a fall in temperature in the more favourable cases. In the more severely ill patients, however, the temperature kept continuously elevated, the pulse became more rapid, numbering over 120 per minute, and the gravity of the patient's condition increased until crisis was reached about the twelfth to fourteenth day.

Crisis.—In no case was the crisis dramatic or sudden; it was more of the nature of a rapid lysis than an actual crisis. Although the temperature fell from 103° F. or thereby to normal in 36 to 48 hours, the patients, while they professed to feel much better, still looked fairly ill and remained in their drowsy condition for some days after the temperature commenced to drop. In the younger children (W. B., 10 years, and J. B., 13 years) the crisis occurred on the tenth and eleventh days, and in the others, except Mrs. E. R., on the twelfth to fourteenth day. From the thirteenth till the twenty-fourth day of infection Mrs. E. R. was exceedingly ill and prostrated. She lay in a low, typhoid state, unable to help herself or ask for anything, muttering frequently, and talking incoherently. The tongue was very dry, cracked, and covered with a blackish fur; the eyes were dull and glazed and the facies bloated and expressionless. From the fifteenth day subsultus tendinum was present, at times to an extreme degree, while on the night of the sixteenth day there was a sharp rigor followed by a collapsed state for 12 hours. At night she was restless and sleepless and for two days there was a smouldering, resentful look in the eyes significant of impending delirium ferox. The pulse was soft, irregular, and increased in rate to 130–140, but from the sixteenth day there was a gradual fall of temperature until on the twenty-third day of illness it reached normal. Convalescence was rather protracted, several weeks elapsing before the patient had regained sufficient strength to sit up.

Temperature and Pulse.—The temperature curve was of parabolic type, commencing from about 100° to 101° F. and rising steadily with slight remissions to 104° on the

FOUR REPRESENTATIVE TEMPERATURE CHARTS.

FIG. 3.

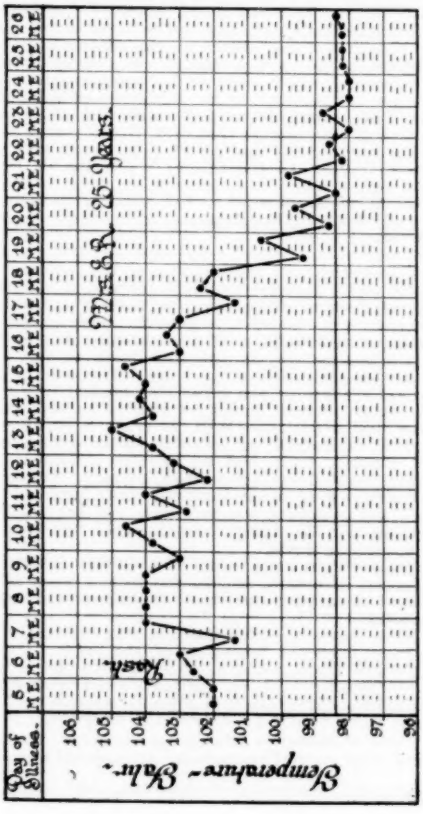


FIG. 4.

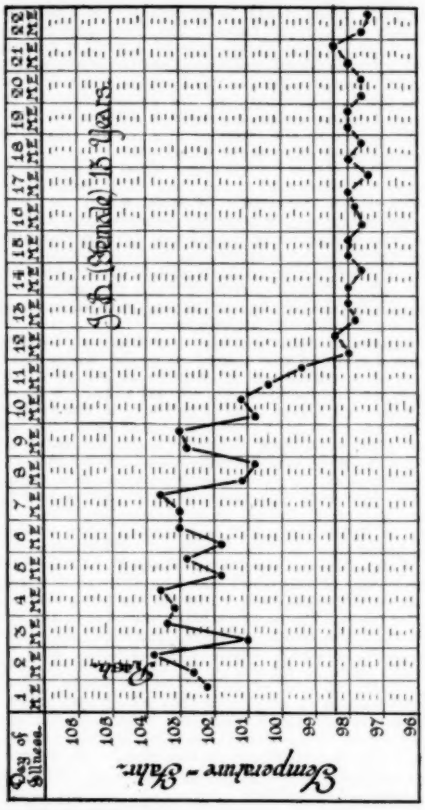


FIG. 5.

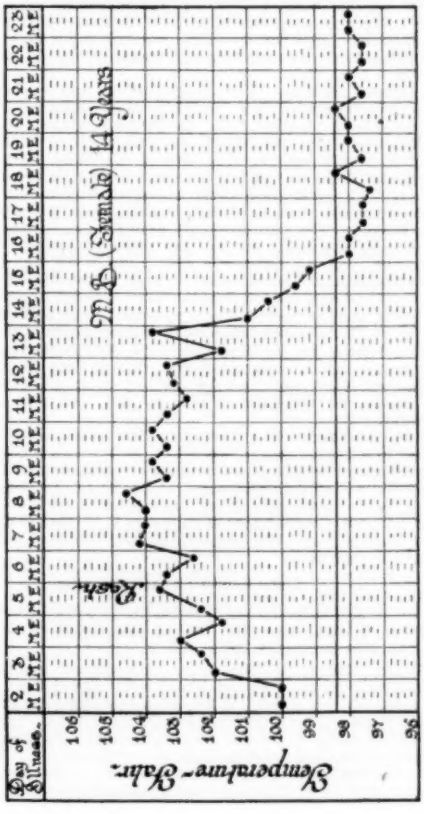
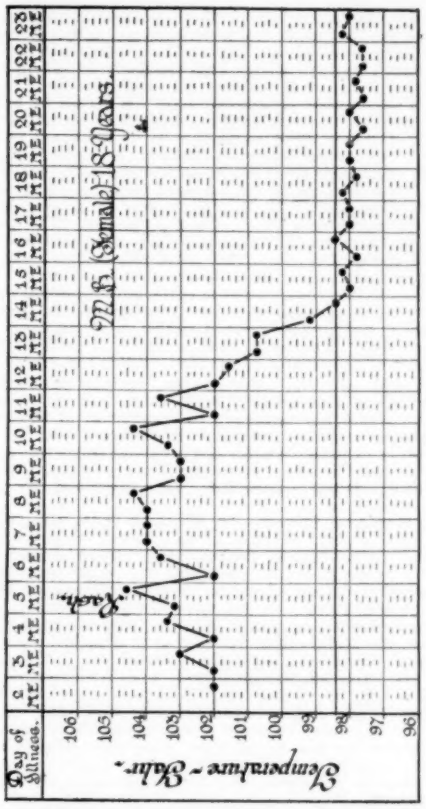


FIG. 6.



fifth or sixth day of illness—the active eruptive period. During the second week the temperature tended to fall a little in the more favourable cases, ranging around 103° and dropping on the thirteenth or fourteenth day to reach normal two days later. This tendency to fall off during the second week of the illness was regarded by Claude Ker [1] as a favourable prognostic sign. Whereas in the severely ill patients the temperature was more or less continuous, in the milder cases it tended to be remittent in character. The temperature chart of Mrs. E. R. resembled that of a case of enteric fever in its slow lysis. The pulse-rate rose with the temperature and ranged from 110 to 120 in most of the cases, but in E. R.'s there was an acceleration to 130 which seems to warrant a bad prognosis. The pulse in the early stages was full and bounding, but later became softer and more dicrotic. The pulse-rate again fell with the temperature (see Figs. 3, 4, 5, 6).

Respiratory System.—Bronchitis and pulmonary symptoms have been regarded as a feature of typhus in previous outbreaks, but in the present series only one case developed bronchitis. The three most acutely ill patients showed a degree of hypostatic congestion during the crisis.

Facies.—In the early stages, and in the milder cases throughout the entire illness, there was no coarsening of the features nor tendency to congestion of the facies with pink-eye, usually described in typhus, but in the more severely ill patients after the eruption there was a definitely congested "heavy" facies with conjunctival injection and a dull, stupid expression, well described by the word "bloated."

Alimentary System.—In all cases there developed a dry parched dirty condition of the mouth with sordes on the gums. The tongue became dry, glazed, covered with a thick brownish fur, and towards the crisis tended to become cracked and fissured, resembling in this respect the tongue in typhoid fever. In the more ill patients it was protruded with difficulty or not at all, and showed a coarse tremor. From the beginning there was loss of appetite, but great thirst was a prominent symptom throughout the entire illness. In the early stages the bowels were constipated, but from the tenth to twelfth day looseness developed in several cases ("the critical evacuation") and with one patient (S. B., 20 years) an acute attack of diarrhœa ensued lasting several days and followed by an intense catarrhal jaundice from the thirteenth to the twenty-third day of illness. In none of the cases could either the liver or the spleen be palpated.

Odour.—A stale odour was detected in several of the cases, but this was not sufficiently distinctive to be regarded as specific. The fœtor of the breath which was present in the cases under review was sufficient to obscure any specific odour.

Nervous System.—The tendency to hyperexcitability in the early stages of the disease in the younger subjects has already been referred to. In the late stage of the illness there were slight meningeal features, such as an appreciable degree of nuchal rigidity and a positive Kernig's sign. Hyperæsthesia was noted in some of the patients. During the second week there was a loss of superficial and deep reflexes, accompanied by involuntary evacuation of bladder and bowels. The pupils usually described as being contracted were not markedly so in the present series. Deafness, however, was an obtrusive symptom in all but two cases. All patients appeared stupid and unintelligent. In the more ill patients speech became slow, slurred, and incoherent, but this seemed to be due in part to mucus collecting in the throat. These cases showed a degree of mental confusion and towards the crisis exhibited a low, muttering type of delirium, talking nonsense and attempting to get out of bed, but were not unduly obstreperous. Hallucinations, delusions, or unpleasant dreams did not appear to be present.

Convalescence.—Convalescence was rapid and uncomplicated in all cases except for W. B. (10 years), who developed an urticarial eruption with a rise of temperature during the second week of convalescence, while M. B. (18 years) had an intractable bacilluria for ten days after her crisis. Deafness and mental sluggishness disappeared in the early days of convalescence and the patients rapidly assumed their former bright appearance.

Laboratory Investigations.

Serological and bacteriological examination of the blood, urine, and cerebro-spinal fluid were carried out in the hospital laboratory.

Blood.—Blood cultures in trypsinised broth yielded negative results. The red blood cells varied from 3,000,000 to 4,000,000 per c.mm. White blood counts showed moderate leucocytosis (15,000 to 20,000 cells per c.mm.), mostly polymorphonuclear in type, with a relative increase of large mononuclear and hyaline cells.

Wassermann Reaction.—This reaction performed before the crisis (about tenth to twelfth day of illness) was positive in four out of six cases. The two negatives were J. B. (13 years), whose illness was of a milder nature, and Mrs. McG., whose blood was tested on the sixth and eighth days of her illness. The reaction, repeated in all cases (except Mrs. McG., who died), on the twenty-first to twenty-third days of illness (approximately a week after the crisis) was still positive in the cases of Mrs. E. R. and S. B. A week later all cases gave negative results.

In 1921 Bauer [2] tested the blood of 50 cases of typhus before the crisis and found that 46 of these gave a positive Wassermann reaction. Tested again in convalescence 20 out of 21 gave a negative reaction, and Bauer concluded that the Wassermann reaction of typhus was almost always positive before the crisis and became negative in convalescence. The findings in the present series agree with his results and support his conclusion that a positive Wassermann reaction before the crisis is helpful in the differential diagnosis between typhus and enteric fever.

Weil-Felix Reaction.—In carrying out this reaction the method adopted was analogous to the Widal test in typhoid. A 24-hour culture of *B. proteus* X 19, grown on an agar slope and emulsified in normal saline, was used as the bacterial emulsion, and dilutions of the patients' serum were made up to 1 : 5000 in every case, the results being read after immersion of the tubes in the water-bath for two hours at 56° C. and 20 minutes at room temperature. The Weil-Felix reaction was tested with each patient's serum every day until the crisis and thereafter every second or third day until the reaction became negative. The earliest day of illness on which agglutinins were demonstrated in the blood was the fifth, when a 1 : 25 dilution of the serum of M. B. (15 years) agglutinated the *B. proteus* X 19 emulsion. The serum of the other cases agglutinated the organism in a similar dilution or in 1 : 50 on the sixth and seventh days of the fever. There was a rapid increase in the agglutinating power of the serum on each succeeding day until the titre for each patient's serum was reached. This varied from 1 : 250 (Mrs. E. R. and J. B.) to 1 : 3000 (S. B. and G. B.), except in the case of W. B., whose serum did not produce agglutination in a dilution beyond 1 : 50. The maximum dilution was always attained before the crisis, and was maintained for a period varying from four to seven days after the crisis, while it fell slowly to become negative at a period varying from six weeks to three months from the onset of the illness.

It is, perhaps, unwise to draw conclusions from such a small series. It would seem, however, that the extent to which agglutinins appeared in the blood varied directly with the severity of the case; on the other hand, the lack of reaction in the case of Mrs. E. R., whose illness was the most severe, would seem to be correlated to a diminished reaction of the blood in the formation of agglutinins. The Weil-Felix reaction was performed with the cerebro-spinal fluid of all cases except that of G. B. (25 years). In only two of the cases, S. B. and M. B. (15 years), were agglutinins demonstrable. In the former a dilution of 1 : 10 of the fluid agglutinated the proteus emulsion when the titre of the blood-serum was 1 : 2500, while in the latter a dilution of 1 : 5 of the fluid agglutinated at the time when the serum titre was 1 : 1000.

Cerebro-spinal Fluid.—In view of the results of the cerebro-spinal fluid examination of the primary case—viz., turbid fluid, increase of globulin, and a cellular exudate composed more of polymorphs than of lymphocytes, and the meningeal features present in most of the cases, the cerebro-spinal fluids of all the patients (except Mrs. McG.) were examined (*a*) in the first week of the illness, and (*b*) immediately before the crisis. The fluid withdrawn at the early stage of the fever was normal in all cases, but the second lumbar puncture yielded a fluid which in the three most ill patients (M. B., 15 years, S. B., and Mrs. E. R.) showed an increase of globulin (salicyl-sulphonic acid test and Pandy's test), but no cellular exudate. Sugar was normal or slightly increased in amount. Cultures on agar and serum were made from the centrifugalised fluid in all cases, but no growth was obtained. Neither the Wassermann reaction nor the Lange colloidal gold test was performed on any of the fluids.

Urine.—The urines were of typically febrile type with a deposit of urates, and in the second week albumin was present in varying amounts. Chlorides were diminished in quantity.

Diazo Reaction.—This reaction was brilliantly positive in all cases from the beginning of the fever. Unfortunately a positive Diazo reaction is given with the urine of other fevers (measles, typhoid, and pneumonia) with which typhus might be confused, so that a positive result is of little diagnostic value except possibly in the early stage of the illness.

Urine Cultures.—Catheter specimens of the urine were taken from each of the female patients and uncontaminated

[1] Ker, C. B.: Manual of Infectious Diseases, p. 220.

[2] Bauer: Munch. med. Wochenschr., 1921, lxviii., 1251–2.

specimens secured from the males on each of three successive days in an attempt to recover *B. proteus* X 19. Gram-negative coliform organisms were isolated from the urine of two of the patients (M. B., 15 years, and S. B.), but emulsions of these organisms were not agglutinated by the patients' serum. Streptococci and staphylococci were present in another specimen, but these were regarded as contaminations. M. B. (18 years) had a coliform bacilluria immediately after the crisis, although her urine had previously been sterile. *B. proteus* X 19 was not recovered from any of the specimens.

Diagnosis.

In the pre-eruptive stage of the fever there were no symptoms which could be regarded as distinctive. Headache, backache, and general malaise are common to such infections as influenza, small-pox in its modified form, and typhoid fever, all of which occur in epidemic form. In the present series the only features which might have helped to differentiate typhus from these diseases were the acute onset with rigors in two of the cases, and the presence within the first two or three days of positive Diazo reactions in the urines. The rash, when fully developed, was distinctive of typhus. The combination of papulo-macules, macules, and subcuticular lesions gave it a pleomorphic character which made it readily differentiable from the other exanthemata. The dull, dusky mottled eruption of the older and more ill cases, however, might be easily missed under the conditions in which typhus is usually found. The Weil-Felix reaction was not positive until the fifth day at the earliest, and usually the rash was fully developed before a positive reaction was obtained, so that its value as a diagnostic feature in the early stages of the illness was practically nil. Later, however, a positive Weil-Felix reaction in a dilution of 1 : 50 or over might be regarded as diagnostic of typhus. The Weil-Felix reaction was done in several cases of typhoid and paratyphoid fever and in scarlet fever with negative results. In the later stages the fading eruption resembled closely the late stage of an intense scarlet fever rash. The resemblance of the primary case to meningitis and the meningeal features present in other cases indicate the necessity for testing the blood for Weil-Felix reaction where a diagnosis of meningitis cannot be confirmed by examination of the cerebro-spinal fluid.

We desire to thank Dr. A. S. M. Macgregor, medical officer of health, and Dr. T. Archibald, medical superintendent, Belvidere Hospital, for their helpful criticism.

THE HEALTH OF THE ARMY IN 1925.

THE new Blue Book [1] on the Health of the Army refers to the calendar year 1925, which, as we have already remarked, is gratifying evidence that the post-war delay is being overcome. The total number of persons concerned, officers and other ranks, being almost the same as in 1924, the lessened incidence of illness is easily seen. The decimal figures which follow are rates per 1000 men, the corresponding figures for the previous year being given in brackets for comparison.

The officers' death-rate stood at 4·44 (3·93); that from injuries had dropped to 1·42 (1·85), while that from "diseases of the digestive system, except liver and tonsillitis" rose to 0·91 (0·39); there were more suicides among officers than among other ranks, more cases of enteric fever (2·1 against 1·1), and officers in India were found to be less well protected by inoculation (87 against 95 per cent.) than other ranks. This incompleteness in officers has been dealt with. Amongst the 193,597 other ranks there were, in 1925, 3600 fewer cases of malaria, 3000 less in India alone, a result which may fairly be claimed as the result of foresight; there were 3600 fewer cases of influenza, and a welcome reduction of 600 in the admissions for venereal disease. In general there were fewer admissions, 446·2 (484·7), fewer deaths, 2·35 (2·80), fewer invalids finally discharged, 11·12 (13·00), and fewer constantly sick, 25·70 (27·11), a tangible all-round improvement. The chief cause of admission was malaria, 51·8; injuries came next. The chief causes of deaths were, from injuries, 0·62 (0·90), from pneumonia, 0·33 (0·33), from digestive diseases as above, 0·25 (0·21). The Commands in which the soldier had least sickness were Channel Islands, 3·9 days illness per man per annum, and Bermuda, 4·19; the heaviest incidence, 20·91 days, occurred in Malaya. The 226 Woolwich cadets had a sick-list of 20·31, those at Sandhurst had 22·00, but local injuries are frequently due to training and games. The boys at the Technical School, who are younger, showed a sick-list of 32·07.

An outstanding feature of the year was the increase in the number of cases of gastric, 41(25), and duodenal, 53 (29), ulcers; they cause much anxiety as they are so insidious. One gastric case had no symptom prior to perforation; a man, found dead in his barrack room at 2.30 P.M., had succumbed to hæmorrhage from a duodenal ulcer, and an athletic officer, admitted for severe anæmia, was similarly suffering. These ulcers are apt to be associated with hyperchlorhydria, and as Mr. A. J. Walton recently reminded the Royal Society of Medicine, they attack some of the finest built men, of whom the more active and energetic tend to have hyperacidity. The report calls these ulcers a disease of non-commissioned officers. Their increased frequency has been noticed also in the Navy too, 52, 48, and 83 being the figures for last three available years, and was associated at a recent meeting of the War Section with recent alterations in diet. These ulcers are not mentioned in the reports from India, but the death-rate there from "diseases of the digestive system, other than of liver or tonsils" has increased to 0·37 (0·24).

Fewer cases of amœbic dysentery were found in India, and fewer liver abscesses were seen; a polyvalent (Shiga and Flexner) antidysentery vaccine has been prepared. Malaria is being dealt with by drainage and other antilarval engineering methods, by nets and electric fans, by better education of the individual, and by keeping troops away from the dangerous areas. It seems to us doubtful whether it is wise to remit microscopical diagnosis as there seems a tendency to do from the report. Pneumonia incidence is greatest at home, and its case-mortality is there highest—e.g., in the Scottish (4·1; 227) and Northern (4·0; 152) Commands, the average figures at home being 2·5 and 100; the death-rate from pneumonia in India is 0·51, and in the rest of the army only 0·25. Sand-fly fever is less prevalent this year, which at Malta is thought to be the outcome of antifly measures, although the authorities at home do not expressly say so.

Pulmonary tuberculosis has slightly increased 1·3 (1·2), its incidence being heaviest in Egypt (2·9), Malta, and the Rhine. Venereal diseases had fewer admissions, 44·4 (46·8), particularly of syphilis, the reduction being ascribed to the increased numbers of ablution centres; through one of these, at Quetta, 6057 men passed and only 8 developed disease. There was great reduction in Malaya, from 108·8 to 65·2, as a result of special effort. The usual treatment of syphilis is with stabilarsan and bismuth. Electrical treatment of gonorrhœa has been discarded but usual treatment is more successful now than formerly, for fewer cases of stricture are met with.

Encephalitis lethargica is regarded as leaving an individual "never likely to make an efficient soldier." One-third of the admissions for mental disease are ascribed to dementia præcox. The increasing number of middle-ear complaints is causing concern. A spleen was removed for splenic anæmia, and the patient is stated to be doing well. An acute case of lymphatic leukæmia ended in death in 14 days. Many cases of chronic appendicitis were found among cases of indefinite dyspepsia, and appendicectomy cured them. In all, there were 942 (881) admissions for appendicitis. Some recruit depôts have had boots

[1] H.M. Stationery Office. Pp. 152. 3s. 6d.

issued to them raised one-third of an inch on the inner side to prevent flat-foot, and care is being taken to keep the recruit off his feet as much as possible with the same object. Several patients have asked for operation for internal derangement of the knee-joint to enable them to go on playing football. Cases of acute synovitis of the knee are aspirated and recovery is then hastened.

New operating rooms are being installed, and X ray coils are being replaced by high tension transformers. Army cooks are given very efficient training, and the Inspector of Army Catering does much to improve the dietary of the soldier. Recruits from country districts have the better teeth, only 4·8 per man diseased or missing, but 6·7 in those from industrial areas, though these have the cleaner mouths; the best and worst were in Scotland (1·4 and 9·3). On the average 4·34 (4·18) diseased teeth were dealt with per man, and Indian troops began to be helped.

There were 381 more recruits examined this year; fewer were rejected and fewer discharged under six months' service. Diseases of the middle ear caused most of the rejections in both groups. There were fewer rejections for insufficient weight, deficient height or chest measurement. It may be that we are now getting past the nutritional handicap of the war. The sanitary education spreading from the Army School of Hygiene, which dealt with 121 officers and 1263 other ranks in the year, is thought to have assisted in securing the improvement observed in the sanitary condition of camps. A very striking improvement was noted in the health of troops on board ship, admissions being 184·0, instead of 233·0, and no deaths; this may be associated with the increased cubic space and better ventilation.

MEDICINE AND THE LAW.

"ADEQUATE MEDICAL AID": THE PARENT'S LEGAL DUTY.

CAN a parent refuse to have his children's teeth extracted for the benefit of their health? Can he decline to allow their adenoids or tonsils to be removed? The answer to these questions was given in the negative nearly 20 years ago, but there are fathers and mothers who are still unaware of their legal responsibility. Section 12 of the Children Act made it an offence for a parent or guardian to ill-treat a child. The offence was made to cover any wilful neglect which caused the child unnecessary suffering or injury to health; it also covered the omission to provide adequate medical aid. Nor was this latter responsibility confined only to those wealthier parents who could afford to pay for the services of doctor and surgeon; it was laid equally upon the less well-to-do who are liable to punishment if they fail to take advantage of the medical services which in various ways are provided for children without charge. Thus a fortnight ago a father and mother were summoned at Tower Bridge Police-court for neglecting to have dental treatment for their son, aged 10. The prosecution said that representations had been made to the parents for the last five years about the boy's teeth and that free treatment had been offered and refused. It was said that in consequence the boy had suffered from abscesses in the jaw, anæmia, carious teeth, and enlarged glands, and that his health was generally poor. His father admitted that the boy's teeth were bad, but said that his son had been attended by a private dentist and that the London County Council doctors wanted to take all the lad's teeth out at once. The magistrate fined the father 40*s.* and 3 guineas costs and fined the mother 20*s.* This was a more vigorous sentence than that of the Bridlington judges, who had recently to deal with another charge under Section 12. The summons was for omitting to have a daughter's tonsils removed, the child having been caused unnecessary suffering and injury to health because the operation had not been performed. Dr. A. K. Jarratt, school medical officer and medical officer of health for the borough of Bridlington, gave evidence that the little girl's tonsils were so greatly enlarged that they almost met; he said it was the worst case he had seen in the schools in 16 years of attendance; he pointed out the danger to the child if she should suffer from an affection of the throat, pneumonia, scarlet fever, or diphtheria. He had many times advised the parents; the nurse had also tried to persuade them to have the operation performed, but they would not consent. Dr. James Kirk gave similar evidence, and no rebutting evidence was called for the defence. All that the father and mother could say was that the little girl never ailed; she was good at her lessons and well up in her class; why should she have an operation when there was nothing wrong with her? The father said there was a similar case in the same street where a little girl had had her tonsils taken out and was none the better for it; if his daughter had to go to hospital she would cry all the time she was there. The magistrates asked the doctors several questions as to the possible risk of the operation; they were evidently reluctant to interfere with the liberty of the subject, yet the medical evidence was clear that the child's growth and development were being impeded and her powers of resisting illness diminished. Finally the bench compromised by adjourning the proceedings and giving the parents a month's grace in which to comply with the medical requirements. If the magistrates had been aware of the facts and the judgments in the leading case on the subject (Oakey *v.* Jackson, decided in 1914) they might have taken a stronger line.

Oakey *v.* Jackson was a case in which a little girl suffered from adenoids and her parents refused to have an operation. There was medical evidence that the disability was causing mental dullness, impaired breathing, deafness, and anæmia, and that a surgical operation for removing the adenoids was the only remedy. The parents did not consider an operation necessary, and did not believe in operations at all—though, apart from this refusal, there was no evidence of neglect. It was argued on their behalf that the Children Act was never intended to compel surgical operations involving the administration of anæsthetics and, perhaps, involving an element of danger to life. Accepting this view the Leicestershire magistrates, before whom the parents were brought, held that there was no legal liability to allow the operation to be performed and that refusal was not wilful neglect within the meaning of the Act. In the King's Bench Division, Darling, J., said that the words of the Act referring to injury to or loss of sight quite clearly showed that the statute contemplated cases of compelling a parent to allow a child to undergo an operation. "It is not necessary to know much about surgery," said the learned judge, "to know that the operation for the removal of adenoids is very common in the case of children and that a failure to perform the operation may result in danger to the child's life if the child should ever happen to be attacked with illness." The judges held that whether or not there had been a failure to provide adequate medical aid must depend on the facts of each particular case. They thought the magistrates might very well have convicted the parents on the facts stated, and they sent the case back to the magistrates for further consideration. Mr. Justice Avory added that one matter to be taken into consideration by the justices in deciding cases of this kind was whether the person who advised the operation was a qualified medical practitioner or merely some irresponsible person. As for "wilful neglect," the judges approved the dicta of Lord Russell of Killowen when Lord Chief Justice. In a case decided in 1899 he said that "wilful" meant that the act was done deliberately and intentionally, not being accident or inadvertence, but so that the mind of the person who did the act went with it. "Neglect" meant want of reasonable care, the omission of such steps as a reasonable parent would take, such steps as are usually taken in the ordinary experience of mankind,

provided that the parent had such means as would enable him to do what was necessary. Means, we know, are forthcoming for the free treatment of school-children in necessitous cases. Parents are often reluctant to send their children to hospital, and magistrates are equally reluctant to use legal compulsion where persuasion has failed. But it is well that there should be no doubt that the parents have, in fact, a legal responsibility and that they commit an offence if they obstruct the provision of adequate medical and surgical aid, and thus fail to give their children the best possible chance in life.

THERAPEUTIC SUBSTANCES ACT, 1925.

DRAFT RULES AND ORDERS.

IN August, 1925, an Act was passed designed to secure the potency and purity of those therapeutic substances in the market for which standards and methods of testing have been devised, but which cannot be tested by purely chemical means. These substances at present include (1) vaccines, toxins, antigens, sera, and antitoxins; (2) salvarsan and its derivatives; (3) insulin and pituitary extract. A joint committee of the licensing authorities concerned in the Act was formed, these authorities being, for England, the Minister of Health; for Scotland, the Secretary of State for Scotland; and for Northern Ireland, the Minister for Home Affairs. To assist this joint committee in devising standards and drawing up regulations an advisory committee was set up, consisting of the following personnel: Sir George Newman (Chairman), representing the Ministry of Health; Mr. John Jeffrey, the Scottish Board of Health; Sir Thomas Houston, the Ministry of Home Affairs in Northern Ireland; Dr. H. H. Dale, F.R.S., the Medical Research Council; Sir Nestor Tirard, the General Medical Council; Dr. C. O. Hawthorne, the British Medical Association; Dr. J. H. Burn, the Pharmaceutical Society of Great Britain; and Dr. J. F. Tocher, the Institute of Chemistry.

The result of the labours of these committees has now been published in the form of the draft regulations,[1] summarised below, which are to come into operation on August 6th, 1927.

The Proposed Regulations.

The regulations consist of seven parts supplemented by forms of application for licence and detailed schedules of the specific requirements for each substance. The first part is concerned with definitions, the second with licences for manufacture of therapeutic substances. Each licensee will have to provide and maintain adequate staff, premises, and plant, not only for the proper manufacture of the substance in respect of which the licence is issued, but also for carrying out tests of strength, quality, and purity, unless he makes arrangements with some approved institution for tests to be carried out regularly on his behalf. He must keep records of the details of manufacture of each batch of the substance, and of the application of the tests, in a form convenient for inspection. Any premises where manufacture of therapeutic substances is carried on are to be liable to inspection, also the processes of manufacture and the means employed for standardisation and testing. Any change in the expert staff responsible for manufacture or testing of the substances used, or any material alterations in the premises or plant have to be notified. The continued production of any substances under conditions which do not satisfy the licensing authority will not be allowed.

The third part of the regulations provides for the proper labelling of the containers in which the substances are sold. If any therapeutic substance is advertised or sold as a proprietary medicine or is contained in medicine so advertised or sold, the name stated in the relative schedule as being the accepted scientific name or name descriptive of the true nature and origin of the substance is to appear on the label. Moreover, the proper name of the substance is to be set out in letters not smaller or less conspicuous than those in which the proprietary name, if any, is printed or written. On the label, or printed or written in indelible ink on a wrapper, is to be set out the name and address of the manufacturer, the number of the licence under which the substance is manufactured, a distinctive batch number, the date on which the manufacture of the batch was completed, and a statement of potency or toxicity where tests for potency or toxicity are required.

An interesting provision is that—

> No person shall sell any therapeutic substance after the date recorded on the container, label, or wrapper as the date up to which the substance may be expected to retain a potency not less than, or not to acquire a toxicity greater than, that required or permitted by the test, as the case may be: Provided that a person may at the request of a registered medical practitioner sell after the date aforesaid any therapeutic substance (except such as are required to be tested for maximum toxicity) which loses its potency, if he has previously drawn the practitioner's attention to the dates recorded on the container, label, or wrapper, and the practitioner is satisfied that the sale is required by the urgency of the case.

The fourth part of the regulations deals with standards of strength, quality, and purity and tests for determining whether these standards have been attained. Precautions are taken to ensure that the preparations are sterile and that the samples are typical of the rest of the batch. The hydrogen-ion concentration of the media to be used in making the tests is set out, and a general account is given of the methods used.

In Part V. of the regulations licences for import of therapeutic substances are considered, precautions being taken to see that substances not manufactured in this country but offered for sale here should not fall below a reasonable standard.

Research Licences.

In Part VI. the conditions on which special licences to import therapeutic substances for the purpose of scientific research are to be granted are set out as follows:—

> (1) The licensee shall use the substances imported under the licence for purposes of scientific research exclusively, and shall carry on such research in the place specified in the licence;
>
> (2) The licensee shall allow any inspector authorised by the licensing authority in that behalf to enter with or without prior notice the premises where the substances are kept and to inspect the premises and investigate the manner in which the substances are being used, and to take samples thereof;
>
> (3) The licensee shall keep a record of the substances imported under the licence, together with the quantities imported, the date of importation, and the name of the manufacturer;
>
> (4) The licensee shall comply with such further requirements, if any, applicable to the holders of research licences, as may be specified in any regulations which may be made under the Act, and of which the licensing authority has given to the licensee not less than one month's notice.

Part VII. provides that the regulations are not applicable to therapeutic substances which are labelled as intended to be used only for veterinary purposes.

Schedules.

The schedules which follow the draft regulations include forms of application for various forms of licence and the provisions applicable respectively to the production of bacterial vaccines, of vaccine lymph, of toxins and antigens, of diphtheria prophylactic, of tuberculin and tubercle vaccines and of sera from living animals. The provisions as to particular sera and antitoxins are then set out, including those applicable to antimeningococcus serum and to other sera for which no potency test is described, to anti-dysentery sera, to diphtheria antitoxin, and to tetanus antitoxin. The third schedule gives details of the general provisions applicable to salvarsan and its

[1] Draft Rules and Orders, 1927. Therapeutic Substances. H.M. Stationery Office. Pp. 33. 9*d*.

derivatives and the special provisions applicable to various named derivatives. The fourth schedule is concerned with insulin. It is to be a condition of every licence for the manufacture of insulin that it shall be issued either as a sterile watery solution or in the form of sterile compressed tablets readily and completely soluble in water; that insulin shall not be issued mixed with other therapeutic agents except with the previous consent of the licensing authority; and that insulin shall not be issued with the recommendation for its administration by any other method than that by injection through the skin. The schedule concerned with pituitary (posterior lobe) extract concludes the list.

SCOTLAND.

(FROM OUR OWN CORRESPONDENT.)

Infectious Disease at Dairies.

THIS is the title of a compact circular just issued by the Scottish Board of Health. The object of the circular is to point out what the dairymen and their employees can do, and may be punished for not doing, in their efforts to assist the local health authority to protect the milk-supply from contamination with infectious diseases. In this regard the Milk and Dairies (Scotland) Act, 1914, which, after one or two postponements on account of the war or post-war conditions, is now in force, placed on dairymen and their workers very specific obligations. It is the manifest interest of dairymen to take every step at the earliest moment to secure that no infected person handles cows or milk, and to invoke the help of the medical officer of health. It appears to be the case, however, that, according to the circular, "when a milk-supply is suspected of causing disease the attitude of the producer of milk and his employees is too often one of indifference or of actual obstruction." These, as every county or city medical officer knows, are very mild words for the conditions experienced. Fortunately, the machinery for detection is now efficient enough to create a wholesome fear, and fear is a good schoolmaster even for slow wits.

The circular details with precision the legal duties of dairymen and their employees and the powers of the medical officer of health and the local authority. To give special point to the new circular, the Board records the following:—

> "During 1926 several outbreaks of infectious disease were spread by milkers who, themselves infected, continued to milk cows. In one outbreak about 150 cases of dysentery were caused by a milker who had contracted the disease and continued at work, though she suffered from what was apparently diarrhœa, and broke the law by continuing to work while so suffering. In another outbreak over 150 cases of scarlet fever were caused by a milkmaid who continued to milk cows while suffering from a mild attack of scarlet fever. In spite of careful inquiries, essential facts were withheld from the medical officer of health which, had they been disclosed, would almost certainly have curtailed this serious outbreak."

The circular is to be had from the Stationery Office for 1*d.*, and all concerned should possess it.

Sampling of Bottled Milk.

In response to representations by the Association of Public Analysts the Scottish Board of Health has issued a short set of directions for sampling bottled milk under the Sale of Food and Drugs Act. At first sight nothing seems more simple. But experience tells a different tale, for we learn that "unequal distribution of the butter-fat is particularly liable to occur in the case of bottled milk, and as the sale of bottled milk is spreading rapidly, it is necessary to reconsider the methods of official sampling." The point is to secure that, before the sample is taken, the milk shall be thoroughly mixed. Evidence laid before the recent Scottish Departmental Committee on the Milk Standard showed how many pitfalls there are in sampling even when the persons concerned are all honest. Case after case has been wrongly decided on account of slip-shod sampling. This circular contains a series of nine special precautions and these have obviously been carefully thought out in concert with analysts and sampling officers. This circular also is to be had for 1*d.* and should be in general circulation.

Physical Education.

The College of Hygiene and Physical Education at Dunfermline continues to be the centre of Scottish activities in physical education and related subjects. It is many years ago since, in coöperation with the Scottish Education Department and its officers, the Dunfermline Carnegie Trustees converted the College into a type of medical school, with a medical principal and medical teachers, and trained lay specialists in modern methods of physical education and remedial gymnastics. The College is now a "central institution" under the code. Last week a four days' special course ended, having been attended by 135 students and teachers from all parts of England, Scotland, and Ireland. The course, which included lectures and demonstrations in respect of physical education, swimming, gymnastics, dancing, and games (including umpiring), was conducted under the auspices of the Scottish League for Physical Education (Women), the Carnegie Trustees granting the use of the College and gymnasium for lectures and demonstrations.

How eminently fitted for these purposes this carefully designed College is, only those familiar with its past work can understand. Andrew Carnegie placed Scotland in an enviable position when he made this fine institution possible.

The Reorganisation of Offices (Scotland) Bill.

The Bill for the conversion of the Scottish Board of Health and the Scottish Board of Agriculture from "boards" into "departments" of health and agriculture respectively, has not yet passed the second reading, the debate having been adjourned under the rules of the House. Meanwhile, the Executive Committee of the National Farmers' Union of Scotland have had the matter before them and have passed a unanimous resolution protesting "against this Bill in so far as it proposes to abolish the Board of Agriculture in Edinburgh." It is interesting to find that, at last, the farmers have something good to say about the Scottish Board of Agriculture; but the importance of their resolution lies chiefly in the fact that this Board and the Board of Health stand or fall together. The resolution, however, stresses the wrong point. In his second reading speech, Sir John Gilmour made it perfectly clear that, so far as the relation of London to Edinburgh was concerned, the Bill made no difference whatever. At the present moment the Secretary of State for Scotland is head of both Boards and controls, positively and negatively, everything they do. The Boards are not independent in any sense. For each of them the Secretary of State is responsible and neither board is final in any decision. Sir John Gilmour pointed out that the day for the "board" type of executive was over and the "department" type, as in the Scottish Education Department and the Ministry of Health was, at least for these two boards, preferable. There is much to be said for and against; but when the change is made the relationship to London will remain as it is now. The history of all the Scottish "boards" is long and interesting. It would form a good study in the working of political patronage. This, indeed, was one of the points urged in favour of the reform.

CHEMICAL RESEARCH AT NOTTINGHAM.—It is announced that Boots Pure Drug Company, Ltd., have decided to extend the scope of their research work at Nottingham; new laboratories are being equipped and the staff of research chemists will be increased. The head of the research laboratories will be Mr. F. L. Pyman, D.Sc., F.R.S., professor of technological chemistry in the University of Manchester and in the College of Technology. He is well known for investigations into the chemistry of the alkaloids and of related synthetic compounds; recently he has devoted much attention to the glyoxaline group and has effected a synthesis of histidine.

Public Health Services.

REPORTS OF MEDICAL OFFICERS OF HEALTH.

County Borough of Plymouth.

1926 statistics: population—211,350; birth-rate, 17·2; death-rates per 1000 of the population: all causes, 12·3; tuberculosis, 1·0; cancer, 1·5; respiratory diseases with influenza, 2·6; heart disease, 1·5. Death-rates per 1000 births: neonatal, 2·9; infant, 72; mothers from childbirth, 3·0.

Dr. A. T. Nankivell in last year's report said he would like to see every medical member of his staff engaged in some research work and, following up this idea, he writes the introduction to this year's report and leaves it to his staff to deal in special reports with various aspects of the public health work in Plymouth and its institutions. The cost of the maternity and child welfare work is less than a penny rate. An additional woman doctor and two more health visitors have been appointed; ultra-violet light has been installed at Stonehouse and a new centre approved at Beaumont Park. Dr. Ann Clark reports that antenatal clinics have been increased from one to four per week and that the antenatal work of the nursing associations is now conducted by her staff. She also reports in detail as to the results of light treatment, which has been chiefly beneficial in rickets, but cases of malnutrition, chronic bronchitis, anæmia, and skin disease have also responded well. To achieve the aim that no confinements shall take place in squalid and dirty homes, a long and difficult fight is needed, says Dr. Nankivell, in order to overcome the west country prejudice which exists against lying-in homes and in favour of mothers being confined in their own tenements, however unsuitable these may be. Plymouth also needs a convalescent home for debilitated mothers, a hostel where little children may be cared for when the mother is in hospital or sanatorium, and day nurseries.

The school service needs a residential open-air school in the country, an increase in the dental staff, and a third dental clinic. During the last three years the Wassermann test was recommended for 307 children. In 26 cases the parents refused. In 72 a positive result was obtained; 34 of these children being at ordinary schools, 22 at mental deficiency schools, 14 at open-air schools, one at a school for the deaf, and one not at school. Dr. G. D. Kettlewell, the V.D. officer, says it has always been recognised that a large number of congenital syphilitics were not being treated in Plymouth. Special efforts have been made in recent years to search them out, and a table is given showing the nature of the 533 cases which have been treated at the centre since 1919. Of these, 313 were children of school age and included 66 cases of serious eye trouble, mostly due to ulceration; 7 deaf children; 23 sufferers from bone disease, of whom 10 were cripples and 2 had been absent from school for over two years owing to the offensive smell from the nose; 15 cases of skin disease; and 71 mentally deficient (of whom nearly all have improved greatly under treatment). Thirty-three of the brothers and sisters, who themselves showed "no signs," were treated tentatively and the majority improved generally in health and development. "Physically all congenital children are stunted," says the report, "ill-developed, and diminutive, many of 10 and 12 years are physically aged 6." The estimate is put forward that there are 1000 congenital syphilitics among the children in Plymouth needing treatment, including the 313 already receiving it. School teachers and nurses have given the very greatest help in searching out these children. Dr. Kettlewell points out the handicap for life of these subjects, many being quite unable to earn a living, while many will live in institutions for the blind and mentally defective, tragedies some of which might have been averted if the children had been treated early enough.

Plymouth has now obtained hospital accommodation on shore for small-pox at the Lee Mill Hospital of the Plympton rural district council, and it is intended to add 20 beds to this hospital; the port medical officer, Dr. Arthur Massey, points out that Plymouth is specially exposed to risk through its shipping and that the hospital ship *Flamingo* was quite unfitted to fulfil the function of providing accommodation for small-pox. One case was landed from shipboard during the year without spread.

The damage done by rats in Plymouth is estimated at £300,000 annually. Energetic warfare is waged against them all the year round and not only in a "rat week." Dr. Massey urges, however, that much could be done by naval architects to reduce "rodent amenities" to a minimum, when the ships are constructed. The experiment was tried of spraying the sea gulls with a special methylene-blue solution to find out if they went from the sewage outfalls to the fresh water reservoirs. "No blue gulls were afterwards seen around reservoirs or docks—a fact which has not been satisfactorily explained." Sir Alexander Houston's contention, it may be remembered, is that at some of the Metropolitan Water Board reservoirs frequented by gulls, the tendency for the *B. coli* to be reduced by storage of the water may be more than counteracted by the number of *B. coli* in the excreta of the gulls dropped into the water.

The tuberculosis death-rate, as shown by a chart, remained stationary during 1920–24, but showed a distinct decline in both 1925 and 1926. More hospital and sanatorium accommodation is needed for both pulmonary and non-pulmonary cases, as there is always a distressing waiting-list. The shortage of low-rented houses remains acute. Sooner or later, says Dr. Nankivell, we shall have to recognise that subsidised houses for persons who can only pay 2*s*. 6*d*. a week rent are needed in every town. He would also like to see municipal hostels or common lodging-houses provided, one for men, one for women, and one for married coulpes.

Three insanitary areas were scheduled more than a year ago but progress is very slow. The renovation of houses, however, continues to be satisfactory and owners spent about £28,000 in repairing old property during 1926. Over 800 samples of milk were examined bacteriologically and as the vendors are always informed of adverse findings this helps to improve the cleanliness of the milk-supply. About 700 churns come in daily, and Dr. Nankivell would like to have the contents of each churn examined once a month instead of once a year, as at present. The demand for clean milk grows; 33 dairymen sell "Certified" or "Grade A" milk. The M. and C. W. centres obtain "Certified," the isolation hospital "Grade A (t.t.)" and the relief milk for consumptives is "Grade A."

Health propagandism has included many lectures by the medical staff, the issue of a booklet "Health Hints"—to the extent of 55,000 copies, a free health film week, leaflets and posters, and much help from the press.

REPORTS OF PORT MEDICAL OFFICERS.

The Tyne.

IN his report for 1926 to the Tyne Port Sanitary Authority Dr. W. E. Harker states that he visited 56 vessels on account of sickness reported or suspected on board, and removed from ships one case of influenza, one of diphtheria, and one of enteric fever. No infectious disease was found among the 9414 alien passengers, who were mostly clean. No case of cholera, plague, or yellow fever came under notice, but 3171 rats were caught on 78 vessels. On 15 ships a total of 229 rats were killed with sulphur dioxide; hydrocyanic acid was not employed. Just over half the dead rats were black, and none of them was infected with plague. Seventeen ships had their drinking-water tanks emptied and purified because they came from ports at which cholera was present or suspected.

The main food imports into the Tyne were wheat, sugar, eggs, and fruit; no condemnations are reported. The fish landed was good; 28 of 7921 fishing boats

had to be cleansed and deodorised. In 6538 inspections of ships sanitary defects were found in 11 per cent. of foreign-going and in 6 per cent. of coasting vessels. Peaks, fo'c'sles, w.c.'s, and bilges of 541 vessels were found dirty and were cleansed; 1016 old beds were burned on account of infection. Many structural defects were noted and rectified. The 18 water boats of the port were examined and their tanks found in good condition.

The Tyne Floating Hospital is now reserved for the isolation and treatment of the more dangerous infections from overseas, and is also equipped as a cleansing station. Other infectious cases are sent to the City Hospital. The usual measures were taken for the treatment of venereal disease, but Dr. Harker offers no estimate of their usefulness.

The work of the port decreased during 1926 by 20 or 30 per cent., probably because of the coal dispute.

INFECTIOUS DISEASE IN ENGLAND AND WALES DURING THE WEEK ENDED APRIL 9TH, 1927.

Notifications.—The following cases of infectious disease were notified during the week:—Small-pox, 391 (last week 392); scarlet fever, 1271; diphtheria, 943; enteric fever, 40; pneumonia, 1052; puerperal fever, 32; puerperal pyrexia, 101; cerebro-spinal fever, 10; acute poliomyelitis, 7; encephalitis lethargica, 30; continued fever, 2; dysentery, 6; ophthalmia neonatorum, 132. No case of cholera, plague, or typhus fever was notified during the week. No further cases of small-pox were notified in Kent or Surrey.

Deaths.—In the aggregate of great towns, including London, there was no death from small-pox, 2 (0) from enteric fever, 76 (5) from measles, 2 (0) from scarlet fever, 76 (19) from whooping-cough, 28 (9) from diphtheria, 37 (6) from diarrhœa and enteritis under two years, and 120 (14) from influenza. The figures in parentheses are those for London itself.

THE 1921 CENSUS.—The General Report on the Census of England and Wales, 1921, published on April 19th (H.M. Stationery Office, 5*s.*) completes the series of official volumes issued in respect of the 1921 Census, dealing with the country as a whole in much the same way as the report issued with each county volume dealt with the local figures. The first and most important section deals with the numbers of the population, its distribution throughout the country, its growth since the preceding census in comparison with that of earlier periods, and also with the contemporaneous growth of other nations. The population numbered rather more than 37¾ millions, 649 to each square mile on the average, or about an acre per head, a density greater than that of any country in the world for which statistics are available. Nearly 80 per cent. of the population were enumerated as living in urban areas, and of these practically half were found in comparatively dense aggregates represented by 46 towns each containing more than 100,000 persons. The rate of growth of the smallest towns is above the average for the whole country, and the rate appears to increase as the towns get larger, until the populations reach a figure in the neighbourhood of 100,000. After this the rate of increase tends to slacken off, suggesting that 100,000 roughly marks a limit of effective aggregation beyond which the advantage of further accretion begins to be offset by counterbalancing disadvantages. Prominent amongst the towns which showed little increase or which decreased during the decennium are those associated with the textile industry in Lancashire and Yorkshire. The new section on Dependency and Orphanhood provides a survey of the sizes, age constitution and distribution of economically dependent families in relation to their parents. The comparative rarity of the large family in general is exemplified by the average which for all married men taken together measured only 1·27 children apiece. More than 43 per cent. of the married men returned no children under 16, while in another 23 per cent. there was one child only. Miners returned the largest families on the whole, but even so their average was only 1·82 for each married man, while in the case of professional men the figure sinks as low as 0·90. The fertility study, derived indirectly from the dependency statistics, throws light upon certain aspects of the birth-rate in this country which is not obtainable from the ordinary registration records.

Correspondence.

"Audi alteram partem."

TESTS FOR DRUNKENNESS.

To the Editor of THE LANCET.

SIR,—The British Medical Association Committee, under the able and wise guidance of its Chairman, Major-General Sir William Macpherson, gave the fullest attention to all possible methods for determining whether "a person concerned was so much under the influence of alcohol as to have lost control of his faculties to such an extent as to render him unable to execute safely the occupation in which he was engaged at the material time." The evidence put before the Committee proved conclusively:—

(1) That in different individuals the quantity of alcohol required to impair the function of the higher nerve centres was subject to great variations—e.g., in a person unaccustomed to alcoholic consumption a very slight amount might cause serious impairment, while in the case of the person inured to the effects of alcohol relatively large amounts might be ingested without appreciable impairment of control of the faculties.

(2) That in the performance of complex occupational acts such as the driving of a motor-car an experienced driver might be little affected by relatively large amounts of alcohol since his long experience of driving has caused his control of the car to become almost automatic.

On the other hand, a driver of less experience who has to think of each of the special actions required for the complete control of his car before their execution would be seriously affected by a relatively small amount in his driving efficiency, whereas as regards other occupations to which he had long been accustomed his faculty control might be perfect. It was considerations such as these which caused the Committee to refrain from placing definite limits on the percentage of alcohol in the blood, cerebro-spinal fluid, or urine which would serve as absolute indications of drunkenness.

The Committee attached the highest importance to the valuable work of Dr. Southgate on the excretion of alcohol in the urine and its presence in the blood, and each member of the Committee was provided with a copy of his paper. I myself presided at the meeting of the Medico-Legal Society at which Dr. Southgate and Dr. Godfrey Carter read their paper On the Excretion of Alcohol in the Urine as a Guide to Alcoholic Intoxication, and at that meeting I described this work as a most important and valuable contribution to the science of toxicology. In the present state of our knowledge, however, it is impossible to give exact figures of the percentage of alcohol in blood or urine, which would in any individual mean that the borderland of sobriety had been passed, and the authors of the paper refrained from giving such an exact figure.

Apart from this difficulty there were definite legal objections to the application of the test by the prosecuting authority—for example, the taking of a sample of blood from an accused person who was unwilling might be technically regarded as a legal assault. There is no objection to the application of the test provided that the accused person is willing, and it is to be hoped that this test will be used with increased frequency, and so lead to an extension of our knowledge in the diagnosis of drunkenness. I can imagine no better defence for an accused person than the evidence that the blood and urine at the time of arrest were free from alcohol.

The diagnosis of drunkenness is attended with great difficulty, and the Committee stated that no single test by itself would, as a rule, justify a decision one way or the other. Dr. Southgate is under a misapprehension when he suggests that the Committee regarded the smell of alcohol as a test for drunkenness. A careful perusal of the report will show that all that was claimed for the olfactory test was that "the smell of alcoholic liquor in the

breath or in vomited matter (if any) is a sign of the consumption of alcohol," and conversely that the absence of any smell of alcoholic liquor in the breath of a person at the time of arrest renders it improbable that he had recently consumed alcohol.

The decision as to drunkenness would not rest on this test at all, but on the other tests enumerated in the report.—I am, Sir, yours faithfully,

W. H. WILLCOX.

Welbeck-street, Cavendish-square, W., April 13th, 1927.

VENESECTION FOR NARCOTIC POISONING.

To the Editor of THE LANCET.

SIR,—Your report of the discussion at the Royal Society of Medicine on venesection recalls to my mind an occasion when a free venesection saved the life of a lady who appeared to be dying from the effects of laudanum poisoning.

The patient had swallowed some six ounces of laudanum at least half an hour before I saw her. At first, owing to wild excitement, it was impossible to control her in any way, but she rapidly passed into a stupor, and then her stomach was washed out. Stupor quickly deepened into coma with stertorous breathing, deep cyanosis, and commencing œdema of the lungs. At this stage a free venesection was performed and the beneficial effect was soon apparent. A few hours later the patient was well on the way to recovery. Readers of De Quincey will remember his assertion that opium, in whatever quantity it is taken, does not produce *intoxication*, and that any symptoms of this nature are due to the proof spirit with which the laudanum is prepared. The preliminary stage of wild excitement recorded above may have been induced in this way.

The treatment of opium poisoning by flagellation, cold douches, and exercise forced to the point of exhaustion is now a thing of the past. Since my early hospital days improvements on the treatment then in vogue have taken the form of washing out the stomach with permanganate solutions and, due I believe to a communication by Sir William Hale-White, the use of oxygen inhalation. My experience, given above, leads me to urge also the use of free bleeding when coma is accompanied by cyanosis and signs of respiratory failure.

On leaving the patient's ground-floor flat after several anxious hours, the surgeon and myself were stopped by a constable on the doorstep and requested to give an account of our actions. We had been watched for some time through a crack in the blind!

I am, Sir, yours faithfully,

CHARLES R. BOX.

Devonshire-place, W., April 18th, 1927.

IODISM WITH GLOTTIS ŒDEMA.

To the Editor of THE LANCET.

SIR,—In regard to the occurrence of glottis œdema in subjects with an idiosyncrasy towards iodides, as in the case recorded by Drs. N. W. Snell and L. H. Savin (THE LANCET, April 9th, p. 759), it would be worth while in a similar case to try whether the necessity for tracheotomy could be avoided by a subcutaneous injection of adrenalin on the first appearance of the submaxillary swellings and œdema of the mucous membrane of the pharynx. In a paper entitled the Mycotic Type of Bromodermia and Iododermia: Facial, Pharyngeal, and Intra-oral Œdema, and Swelling of Salivary and Thyroid Glands in Cases of Idiosyncrasy towards Iodides[1] one of the cases to which I referred was that of a married woman aged 43 years. Potassium iodide was ordered for bronchitic symptoms. After three 15-grain doses, all on Jan. 22nd, and accompanied by ten drops of digalen, the iodide had to be discontinued, as the patient developed facial œdema, especially about the orbits, and œdema of the floor of the mouth below the tongue, together with an urticaria-like eruption on the trunk and head (very little on the extremities). She also complained of severe headache. A small subcutaneous injection of adrenalin chloride on the morning of Jan. 23rd seemed to lessen these symptoms. The œdema of the floor of the mouth had practically disappeared by Jan. 24th, and the facial œdema and urticaria-like eruption were almost gone by Jan. 25th. It should be noted that the patient had for several years been subject to occasional attacks of urticaria and occasional œdema about the orbits. Moreover, it was ascertained that on one previous occasion she had manifested an idiosyncrasy towards potassium iodide. I am, Sir, yours faithfully,

London, W., April 9th, 1927. F. PARKES WEBER.

[1] Brit. Jour. Derm. and Syph., London, 1923, xxxv., 169–180.

MENINGITIS ASSOCIATED WITH *B. PROTEUS*.

To the Editor of THE LANCET.

SIR,—The interesting paper of Drs. G. Bewley and E. S. Horgan in your last issue reminds me of the discovery of a bacillus of the same class in the cerebro-spinal fluid of cases of cerebro-spinal fever in the years 1915 and 1916. During the outbreak of cerebro-spinal fever amongst the troops at that period, I, as specialist sanitary officer of the Irish Northern Command, in conjunction with Lieutenant R. B. Purce and Dr. Georgina Darling, made bacteriological examinations of 129 cerebro-spinal fluids.[1] In 113 cases the meningococcus was discovered and in most cases cultivated, in five the tubercle bacillus, in one a streptococcus, in two the pneumococcus, and in one the typhoid bacillus.

In 30 separate cases we cultivated from the cerebro-spinal fluid a bacillus which we designated the *Bacillus meningitidis*. In 14 consecutive cases of our series this micro-organism was found, often at the first puncture, and at several of the consecutive punctures. In one case it was discovered at the first puncture and in this fluid no meningococci were found, but they were present in the cerebro-spinal fluid drawn off at a later date. In all cases the meningococcus was also present. Our bacillus was actively motile, liquefied gelatin, and had no action on glucose, lævulose, galactose, maltose, saccharose, lactose, starch, and mannite. Three strains produced acid in glucose media, but they differed from the other strains in not liquefying gelatin.

The only difference between our bacillus and that described by Drs. Bewley and Horgan is that ours failed to ferment glucose and lævulose. As we wrote at the time, "What the exact position of this micro-organism in a bacteriological classification should be will require further study, but it is evidently allied to the vibriones, the *B. fæcalis alkaligenes*, and the *proteus* group." The majority of the cases were under the care of Dr. A. Gardner Robb, of the Belfast City Fever Hospital, and we satisfied ourselves that we were not dealing with a mere contamination.

I am, Sir, yours faithfully,

W. JAMES WILSON.

Public Health Laboratories, Queen's University, Belfast, April 16th, 1927.

VACCINES AND THE COMMON COLD.

To the Editor of THE LANCET.

SIR,—The results of the investigations by Ferguson, Davey, and Topley, published in your issue of April 16th, call, I think, for some comment, especially in view of the fact that an incomplete summary of the work appeared in a leading daily paper under the heading "Vaccination against Colds—Cure Better than Prevention." To the medical reader it is clear that the conclusion arrived at is simply that *three* doses of a stock vaccine containing eight different organisms failed to protect a certain population against

[1] Brit. Med. Jour., 1916, ii., 900.

the occurrence of common colds, but it is possible that the general public may imagine: (*a*) that this is considered by bacteriologists in general to be the best method of protective anticatarrhal vaccination, and (*b*) that vaccination of any type is useless as a preventive of catarrhal infection.

Many pathologists, with whom my own experience leads me to agree, would not expect to obtain any useful degree of immunity by the injection of only three doses of any anticatarrhal vaccine—stock or autogenous. Here the analogy of antityphoid inoculation is fallacious. On the other hand, it is found in practice that in people who are subject to catarrh pathogenic bacteria can be recovered with remarkable frequency from the nasopharynx, and often from the fæces also, and that a vaccine prepared from these almost always produces immunity for at least a year, and sometimes indefinitely, when a full course—roughly about 16 doses—is administered. Furthermore, the success or failure is largely dependent on the presence or absence of nasal obstruction. Consequently the nose should always be examined and appropriate surgical treatment advised if obvious lesions are found.

The fact that the administration of a stock vaccine, without bacteriological examination of the patient, is more convenient does not prove that this method is useful. The experiments recorded by these three observers afford satisfactory evidence to the contrary. On another point, it is not stated whether the stock vaccine was made from repeatedly subcultured organisms. Most of them are, in fact, so derived. When it is necessary to use a stock vaccine it is, I submit, advisable that it should be prepared ad hoc from fresh bacteria, of which any large laboratory presumably has a supply.

I am, Sir, yours faithfully,

A. KNYVETT GORDON, M.B., B.C., B.A. Camb.

Bedford-square, W.C., April 14th, 1927.

ALLEGATIONS OF NEGLIGENCE IN CERTIFYING A MENTAL PATIENT.

To the Editor of THE LANCET.

SIR,—The leading article in THE LANCET of April 2nd, dealing with the Hume-Spry case, alludes to the need that more effect should be given to such protection as the medical certifier already possesses in such circumstances, while urging that prompt legislation should strengthen that protection.

After a trial lasting some 15 days, Dr. Percy Smith and Dr. Watson, who were charged with having negligently signed a certificate in lunacy, have been completely vindicated by a special jury who stopped the case of their own accord without any direction from the learned judge. How comes it that any doctor can be sued for negligence in the honest discharge of a duty which he owes to the public? He is not bound to certify anyone to be insane; but he must often do so, not only in the public interest, but in the interest of the patient himself who, if not placed under control, may suffer not only irreparable injury himself, but may be led to do that which, if he were in the possession of all his faculties, he would be the first to regret.

The legislature has prescribed a form of protection for the medical profession, and those who were advising the defendants in the present case made the proper attempt to secure it for their clients, but without avail. By S. 330 of the Lunacy Act, 1890:

> "If any proceedings are taken against any person for signing any certificate . . . . such proceedings may . . . . be stayed if the Court or Judge is satisfied that there is no reasonable ground for alleging want of good faith or reasonable care."

Shortly after the Hume-Spry action was launched an application was made pursuant to this section, on the part of the defendants, as a result of which a Master of the King's Bench stayed the action, and his order was affirmed by Mr. Justice Bateson sitting as judge in chambers. The Court of Appeal, however, reversed the learned judge's decision, holding that the matter must go before a jury. The result is what we have seen. A trial which must have involved enormous cost on both sides, and a number of baseless charges "random hurled" in open court against a number of innocent persons. Is it too much to hope that the end of this case may encourage those in whom the power lies to stay such actions in future? Great judges in the past have inculcated that the power should be freely exercised.

A few of the decisions of the courts in the matter may be usefully brought to recollection. In the case of Hall *v.* Semple (1862), 3 F. & F., 337, Mr. Justice Crompton, in charging a jury, said:—

> Take me, then, as telling you, in point of law, that if a medical man assumes under this Statute (the Act then in force) the duty of signing a certificate, without making, and by reason of his not making, a due and proper examination, and such inquiries are necessary, and which a medical man in such circumstances ought to make and is called upon to make, not in the exercise of the extremest possible care but in the exercise of ordinary care, so that he is guilty of culpable negligence, and damage ensue; then that an action will lie, altho' there has been no spiteful or improper motive, and though the certificate is not false to his knowledge . . . . The question is whether there has been a neglect of that duty which a person in a case of this kind owes, not to interfere in a matter which touches the liberty of his fellow citizen without taking due care and making a careful examination and inquiry?"

It was after this that the protecting section appeared in the Lunacy Act of 1890. Its effect has been discussed in several cases. In Shackleton *v.* Swift ((1913), 2 K. B., 304) a woman had been received as an alleged lunatic into a workhouse under an order of a relieving officer. This order required the defendant, the master of the workhouse, to receive and detain the plaintiff for three days. During that period the medical officer examined her and gave a certificate for her detention for 14 days. After this she was detained for six days, when she was discharged again by order of the medical officer. In these circumstances she sued the master of the workhouse, on the ground that her detention for more than three days was unauthorised in the absence of an order of a justice. It was held that S. 330 of the Lunacy Act abovementioned gave special protection to officers and others acting under its powers in cases where, although they might have misconstrued the Act, and although they might have done things which they had no jurisdiction to do, they had acted in good faith and in a reasonable manner. In giving judgment, Lord Justice Vaughan Williams said:—

> "Observe that this case is not a case under the powers of the Judicature Act and Rules. We are not applying a general act to some case which happens to fall within its scope, what we are trying here is the question whether this action ought to be stayed having regard to the terms of the Lunacy Act, S. 330. That is a very different thing to my mind to the case of a question under the Judicature Act and Rules whether an action ought to be stayed or not. Here we are dealing with a particular subject matter, lunacy, and the Act of Parliament itself on the face of the Act—I do not so much say states as provides for, and assures, that public officers will be employed in carrying out the provisions of this Act of Parliament. The Statute in S. 330 seems to me to be a provision which recognises in itself the difficulty that may be experienced by the officers in carrying out this Act of Parliament."
>
> . . . . The principle of the Act is if the proper officers carrying out the provisions of the Lunacy Act, 1890, have acted in good faith and with reasonable care, even though they have made a mistake—even though the Act of Parliament gave them no jurisdiction in the particular case, and therefore there was what was called the ground of want of jurisdiction, nevertheless they are to be protected. That does not mean, to my mind, protected in the end after there has been an action or the action has been tried, it is a protection which relieves them from liability in my opinion before the action has been tried."

The meaning of the section was discussed once more in Everett *v.* Griffiths (1920) 3 K. B. 164, where an action was brought against a chairman of a board of guardians and a doctor. It was there pointed out that the act only imports that the medical practitioner shall act with reasonable *care*. It does not say that he must act with reasonable skill, and in Everett *v.*

Griffiths ((1920) 3 K.B. at p. 184) Lord Justice Bankes said that it was a matter for considerable doubt whether the duty to act with reasonable care involved a duty to act with reasonable skill. He said:—

"To adopt the view that a medical man called in by a magistrate to express an opinion in reference to a person alleged to be a lunatic may be liable in damages for making an incorrect diagnosis, though he may have acted in perfect good faith and used all the care at his command, is to adopt a view which may render the working of the Act in many cases extremely difficult if not impossible: a result which the legislature may have intended to avoid. . . . The Legislature intended that a person having the qualifications laid down in the Statute should be entitled to express an honest opinion arrived at with reasonable care on a matter of extreme difficulty and about which opinions might well differ without exposing himself to the risk of having his skill called in question before a jury and being possibly mulcted in heavy damages. . . A medical man is under a duty towards the alleged lunatic to act in good faith and with reasonable care, but provided he has the qualifications prescribed by the Act, the degree of skill possessed by him or brought to bear upon the examination cannot be called in question."

In view of all this body of opinion it is a little difficult to see why the Court of Appeal refused to stay the action against the two practitioners who were so completely vindicated last week. But it must be remembered that where the liberty of the subject is concerned the right to have the verdict of a jury is one which is regarded as almost sacrosanct.

I am, Sir, yours faithfully,

April 2nd, 1927. JURIST.

RHEUMATISM AND "GROWING PAINS."

To the Editor of THE LANCET.

SIR,—It is in my opinion a grave reflection on the public health authorities that the great bulk of the general public is ignorant of, and totally uninstructed in, the serious significance of the vague pains in the limbs of a child or adolescent. It is a frequent experience of general practitioners to discover irreparable heart lesions, the only rheumatic history obtainable being a diagnosis of "growing pains" by an aunt or a sympathetic neighbour. A little while ago a child was brought to my surgery with aphasia, the loss of speech having been discovered that morning. The child was found to be suffering from endocarditis with a mitral lesion which had given rise to no distress. On inquiry I discovered that a fortnight previously the patient had complained of slight pains in the ankles which were rubbed with a "bottle" and dismissed as growing pains.

The public must be instructed about the earliest symptoms of disease. This is being admirably done in certain diseases, and it remains for the authorities to see that the high mortality from heart disease is decreased by early treatment of its greatest causative factor—acute rheumatism.

I am, Sir, yours faithfully,

ALFRED A. MASSER, M.B., Ch.B.

Penistone, April 11th, 1927.

Sir Charles Hyde, Bart., has telephoned to the B.B.C. station at Birmingham to say he was so impressed by the address on the work of Lord Lister broadcast by Sir Berkeley Moynihan on April 8th that he had decided to endow a bed in each of the five Birmingham hospitals—the General, the Queen's, the Children's, the Orthopædic, and the Women's Hospitals. The address was broadcast from Leeds and relayed to all stations.

BIRMINGHAM CRIPPLES.—Mr. Neville Chamberlain, Minister of Health, has opened a new centre for the out-patient and administrative work of the Birmingham Cripples' Union and Royal Orthopædic Hospital. The centre is housed in the old Children's Hospital in Broad-street, which has been extensively remodelled, the additions including a series of workshops for the manufacture of surgical appliances. The recent amalgamation of the Cripples' Union and the Orthopædic Hospital has created the third largest hospital charity in the city, with 268 beds, and has necessitated the concentration of scattered offices, workshops, and out-patient departments. The massage attendances last year numbered about 30,000; 5000 cases were treated otherwise, and there is a waiting-list of 500.

Parliamentary Intelligence.

NOTES ON CURRENT TOPICS.

The Easter Adjournment.

THE House of Lords adjourned for the Easter recess on Tuesday, April 12th, until April 28th. Among the Bills to which the Royal Assent was given by commission were the Royal and Parliamentary Titles Act and the Sale of Food and Drugs Act. The House of Commons adjourned on Thursday, April 14th, until Tuesday, April 26th.

HOUSE OF COMMONS.

TUESDAY, APRIL 12TH.

Finances of Scottish Maternity Hospitals.

Sir ARCHIBALD SINCLAIR asked the Secretary of State for Scotland whether he was aware that the new regulations governing the training of midwives had increased the financial burdens on Scottish maternity hospitals; whether the financial difficulties experienced by these hospitals had been considered by him; and whether he was now prepared to recommend to Parliament that grants should be given to Scottish maternity hospitals commensurate with those given to similar hospitals in England.—Sir JOHN GILMOUR replied: I am aware that the receipts of the Scottish maternity hospitals have been diminished by a decrease in the amounts received in fees from pupil midwives. The grants referred to in the question are not, of course, grants to the hospitals as such, but are grants for the purpose of aiding students undergoing a particular course of training. I think that the diminution in entrants may be attributed to the economic consideration that the average earnings of a registered midwife in Scotland do not provide a living wage rather than to the regulations of the Central Midwives Board (Scotland) which lengthened the period of training. I have, however, taken steps to have the position of the hospitals carefully and sympathetically considered, but I am not yet in a position to make any recommendation to Parliament.

Accidents in Mines.

Mr. GRUNDY asked the Secretary for Mines what was the number of fatal accidents in mines in the months of January, February, and March, 1926, and what was the number of non-fatal accidents during the same period; what had been the number of fatal accidents in mines in the months of January, February, and March in 1927, and the number of non-fatal accidents for the same period; and the proportion to the number employed in both periods.—Colonel LANE-FOX replied: During the first three months of 1926 there were 306 deaths from accidents at mines under the Coal Mines Act and 1214 persons were seriously injured. The death-rate per 1000 persons employed was 0·27 and the serious injury-rate 1·07. The corresponding figures for the first three months of 1927, which were increased by the serious disasters at Cwm and Bilsthorpe, were 324, 1291—0·31 and 1·25—respectively. I regret that comparable figures as regards the less serious non-fatal accidents are not yet available.

THURSDAY, APRIL 14TH.

Expenditure on Additional Insurance Benefits.

Sir JOHN POWER asked the Minister of Health the total expenditure during 1926 in respect of each class of additional benefit under the National Health Insurance Act.—Mr. CHAMBERLAIN replied: The total expenditure during 1926 in England and Wales in respect of each class of additional benefit under the National Health Insurance Act—other than additional benefits which take the form of increases of ordinary cash benefits—was approximately as follows:—

	£
Dental treatment	1,146,700
Ophthalmic treatment	155,900
Treatment in hospitals	228,800
Treatment in convalescent homes	43,400
Surgical appliances	33,900
Provision of premises for convalescent homes	9,700
Provision of nurses	7,100
Repayment of contributions	12,800
Payments in want or distress	8,500

Note.—The amount of additional benefit paid by way of increases of ordinary cash benefits (sickness, disablement, and maternity) is not separately recorded.

Poor-law Relief Statistics.

Mr. COMPTON asked the Minister of Health the number of persons in England and Wales in receipt of Poor-law relief at Dec. 31st, 1924, 1925, and 1926 respectively; and the amount of moneys paid and relief in kind granted

during the last week of the above-named years.—Mr. CHAMBERLAIN replied: The following is the information asked for: The numbers of persons in receipt of Poor-law relief (excluding lunatics in asylums) in England and in Wales at the end of December in the years mentioned were:—

	England excluding Monmouthshire.	Wales and Monmouthshire.
In 1924	982,021	111,031
In 1925	1,194,426	150,597
In 1926	1,283,801	222,719

The average weekly amount of out-door relief in money and kind granted during December in those years was:—

	England excluding Monmouthshire. £	Wales and Monmouthshire. £
In 1924	231,952	30,379
In 1925	314,521	38,788
In 1926	367,153	66,426

The figures for Wales and Monmouthshire are those for the union counties in Wales and Monmouthshire.

Local Authorities and Mosquito Pests.

Mr. DAY asked the Minister of Health if he was aware that certain councils were supplying householders with a pamphlet on how to fight the mosquito menace; and would he consider instructing all health authorities to supply householders with similar literature.—Mr. CHAMBERLAIN replied: The attention of medical officers of health throughout the country has already been drawn to the pamphlet published by the British Museum, which gives advice to local authorities as to the best measures to combat the mosquito pests.

The Traffic in Women and Children.

Mr. CECIL WILSON asked the Secretary of State for Foreign Affairs when it might be hoped that the replies of the various Governments regarding Part II. of the Report on the Traffic in Women and Children were likely to be received; and how soon thereafter publication might be expected.—Mr. LOCKER-LAMPSON (Under Secretary for Foreign Affairs) replied: My right hon. friend has no means of forecasting the action of foreign Governments in this matter, but he hopes that the Council of the League will be in a position to take a decision at its next meeting in June.

Inspection of Casual Wards.

Captain BOURNE asked the Minister of Health whether there were now any casual wards in England or Wales where the guardians did not supply night clothing for both men and women; whether in the unions which supplied night clothing, after being used for one inmate, such night clothing was always washed before being given to another; and whether he had, since Feb. 17th, 1925, arranged for evening visits to casual wards by a woman medical inspector of the Ministry of Health.—Mr. CHAMBERLAIN replied: In June, 1926, there were 22 such casual wards. I have every reason to believe that this number has been substantially reduced. The women inspectors of the Ministry (who hold a nursing but not a medical qualification) do inspect the casual wards and I will arrange for them to do so from time to time in the evening.

LEWISHAM NURSES' HOME.—A beginning has been made in the erection at Lewisham Poor-law hospital of a home for the accommodation of 241 members of the nursing staff at a cost of £129,000. The home will include a lecture-room and a library and each nurse will have a separate bedroom.

BRITISH EMPIRE CANCER CAMPAIGN.—Lord Cave presided at a quarterly meeting of the Grand Council on April 12th. The council received the resignation of the organising adviser to the campaign, Lieut.-General Sir John Goodwin, F.R.C.S., who has been appointed Governor of Queensland.—An application for affiliation was received from the National Cancer Campaign (Ireland), which has just been formed, and which includes representatives both of Ulster and the Free State. The application was granted, and good wishes were sent to the new organisation.—Grants of £298 and £900 respectively were made for apparatus and for the upkeep for one year of the radiological cancer research department of the Middlesex Hospital, and a further grant of £3000 was approved in support of the maintenance of the general cancer research department of that hospital.—The grant of £100 to Mr. E. Nevill Willmer, of Manchester University, was renewed for another year to enable him to continue work on tissue culture, and a further grant of £300 was made to Prof. C. E. Walker, of Liverpool, to enable him to continue cancer research.

Medical News.

ROYAL COLLEGE OF PHYSICIANS OF LONDON.—An ordinary comitia of the College was held on April 11th, Sir John Rose Bradford, the President, in the chair. An abstract report was presented of the extraordinary general meeting of the College held on Feb. 10th, 1927, at which the draft of the revised bye-laws was submitted to the comitia for the second time and, with certain small amendments, was approved to be the bye-laws of the College for the time being.

The President then delivered his annual address, in which he reviewed the work of the College during the past year. He pointed out that there were now 379 Fellows. There was a considerable increase in the number taking the membership, the total number of Members now being 836, as against 732 a year ago. He mentioned the honours conferred by the King upon Fellows, Members and Licentiates of the College, including that of K.C.B. upon Lord Dawson of Penn, the K.B.E. upon Sir Stanley Hewitt, and the knighthood upon Dr. Henry Head. He also alluded to the gifts made to the College, including a replica of the portrait of Sir Richard Douglas Powell, painted by Mr. Spencer Watson and given by Colonel Sir Douglas Powell; a silver claret jug from Mr. H. T. Herring; and a china tea service from Mrs. Alec Tweedie, which had been a presentation to Dr. Alexander Tweedie in 1802. He also referred to the revision of the bye-laws and to the power that the College now assumed of granting Honorary Fellowships in special circumstances.

The President then delivered obituary addresses upon the career and work of the 15 Fellows who had died in the past year—namely, Dr. F. S. Palmer, Dr. E. S. Reynolds, Sir John Williams, Sir W. B. Leishman, Sir F. W. Mott, Dr. John Thomson of Edinburgh, Dr. Robert Hunter Steen, Dr. R. H. Cole, Dr. J. G. Adams, Dr. James Barry Ball, Dr. Francis Warner, Dr. Thomas Claye Shaw, Sir Isambard Owen, Dr. Llewellyn Powell Phillips, and Dr. Thomas R. Bradshaw.

Sir David Ferrier, the senior Fellow present, then proposed a vote of thanks to the President and asked, at the special wish of the College, that he would allow his address to be printed and circulated.

Sir John Rose Bradford was re-elected President for the ensuing year.

Diplomas in tropical medicine were granted, jointly with the Royal College of Surgeons, to the following 24 candidates who have passed the required examination:

S. Annecke, E. G. Anthonisz, A. C. L. O'S. Bilderbeck, Catherine V. Burne, N. P. Dalal, T. B. Gilchrist, R. D. Gross, Kathleen M. Halloran, R. G. Keays, H. H. W. Kumm, F. R. Lockhart, A. D. Loganadan, P. H. Martin, F. R. L. Miller, Margaret M. Nolan, J. Portelli, Helen M. Russell, E. G. Sayers, H. M. Shelley, Viva E. K. Stuart, H. S. Townsend, Bertha Williamson, C. J. Wylde, and W. A. Young.

ROYAL COLLEGE OF SURGEONS OF EDINBURGH.—At recent examinations out of 40 candidates entered the following 16 passed the Final Dental Professional Examination and were granted the Diploma of L.D.S. R.C.S. Edin.:—

John McAra, A. L. Cadenhead, David Logie, Bernard Silverston, W. G. Thow, Sri Kishan Kapur, R. G. Chambers, S. W. Cruickshank, V. L. Shearer, A. R. Ferguson, C. C. Gair, N. I. Macmillan, A. J. de Villiers, E. H. B. Gooch, T. T. Jamieson, and Thomas MacLaren.

BRITISH PATHOLOGISTS ASSOCIATION.—At a meeting of the council of this Association held on April 9th, the following resolution was adopted:—

"That inasmuch as it is confidently expected that steps will shortly be taken by the Ministry of Health for the provision of pathological investigations for patients insured under the National Health Insurance Acts, and furthermore, inasmuch as any arrangements made to this end at this time by individual National Health Insurance authorities must necessarily influence the matter when it comes up for final settlement, it is in the opinion of the British Pathologists Association in the highest degree inadvisable that any such local arrangements should be entered upon at this time, except upon the basis of payment per examination performed and not by payment of lump sum irrespective of work done; further the Association considers that the fees charged should be such as to cover adequately the real cost of the work performed, otherwise the service becomes a charge upon the funds of the institution undertaking it."

A schedule of proposed fees for pathological investigations for insured patients is now in course of preparation by the Council and will be circulated among members of the Association when complete. These fees, it is stated, are based upon a carefully prepared costing scheme and may be regarded as representing the lowest charges at which the procedures indicated can be performed.

UNIVERSITY OF LONDON.—At a meeting of the Senate held on March 23rd, it was resolved that a statement be published to the effect "that candidates for the degree of B.D.S. will be required to pass the First Examination for Medical Degrees before proceeding to the Second Examination in Dental Surgery."

Three lectures on Sensation and the Sensory Pathway will be given by Dr. J. S. B. Stopford, F.R.S., professor of anatomy in the University of Manchester, at University College on May 3rd, 4th, and 6th, at 4.30 P.M.

Four lectures on the Autonomic Nervous System will be given by Dr. R. J. S. McDowall, professor of physiology in the University, at King's College, at 5 P.M., on Tuesdays, May 3rd, 10th, 17th, and 24th.

A course of four lectures on the Menstrual Function, its Physiology and Pathology will be given by Mr. H. Beckwith Whitehouse, professor of midwifery and diseases of women in the University of Birmingham, at the London (R.F.H.) School of Medicine for Women on Mondays, May 9th, 16th, 23rd, and 30th, at 5.30 P.M.

Dr. Andrew Balfour will take the chair at the first of four lectures on National, Regional, and Town Development Planning to be given by Mr. W. H. McLean, late Egyptian and Sudan Government Services, at University College on Tuesdays, May 10th, 17th, 24th, and 31st, at 5.30 P.M.

Three lectures on Problems of Mental Work will be given by Prof. A. Michotte, of the University of Louvain, at King's College on May 10th, 12th, and 13th, at 5.30 P.M.

Three lectures entitled Some Surgical Problems will be given by Mr. John Fraser, regius professor of clinical surgery in the University of Edinburgh, at the Middlesex Hospital Medical School on Monday, Tuesday and Wednesday, May 16th, 17th, and 18th, at 5 P.M.

A course of four lectures on Inflammation and Infection will be given by Dr. E. H. Kettle, professor of pathology in the Welsh National School of Medicine, at Guy's Hospital Medical School, on May 20th, 27th, 31st, and June 3rd, at 5.30 P.M.

The Senate will shortly consider applications for grants from the Dixon Fund, which are allocated annually for the purpose of assisting scientific investigations, and from the Thomas Smythe Hughes Medical Research Fund. Applications are also invited for the Laura de Saliceto Studentship for the advancement of cancer research. A University studentship in physiology, of the value of £50 for one year, will be awarded to a student qualified to undertake research in physiology.

University College.—On Friday, May 13th, at 8.30 P.M., an address entitled University College and Medical Education, will be given by Sir John Rose Bradford, F.R.S., President of the Royal College of Physicians of London.—On Thursday, June 23rd, at 3 P.M., their Majesties the King and Queen will inaugurate the centenary celebrations of the College.

UNIVERSITY OF DURHAM.—The summer session began on April 21st, and post-graduate classes will meet each Thursday until June 16th at the Royal Victoria Infirmary, Newcastle.

MEDICAL SOCIETY FOR THE STUDY OF VENEREAL DISEASES.—On Friday, April 29th, at 8.30 P.M., a meeting will be held at Chandos-street, London, W. 1, when a paper will be read by Dr. R. N. Ironside on the Prophylaxis of Neurosyphilis. A discussion will follow.

CHELSEA CLINICAL SOCIETY.—The next meeting of this society will be held next Tuesday, April 26th, in the Governors' Committee-room, at St. George's Hospital, at 8.30 P.M. There will be a discussion on Peptic Ulcer in which Dr. Robert Hutchison, Dr. J. A. Ryle, and Mr. H. W. Carson will take part. The date of this meeting has been altered from the previous Tuesday.

ROYAL SANITARY INSTITUTE.—A sessional meeting will be held in the Guildhall, Exeter, jointly with the West of England Branch of the Society of the Medical Officers of Health, on Friday, April 29th, at 2 P.M., when discussions will take place on Recent Legislation Affecting Maternity and Child Welfare Schemes (Dr. J. F. Blackett, Dr. G. Adkins, and Dr. T. Dunlop) and on the Housing (Rural Workers) Act (Dr. C. E. Tangye, Dr. H. B. Mapleton, and Mr. A. J. Redfern).

MAUDSLEY HOSPITAL.—A series of five clinical demonstrations of Types of Mental Disease will be given at the Maudsley Hospital, Denmark Hill, by the Medical Superintendent, Dr. Edward Mapother, at 2.30 P.M., on successive Wednesdays, commencing on April 27th. The fee for the course will be 1 guinea.

MEDICO-LEGAL SOCIETY.—An ordinary meeting of the society will be held at 11, Chandos-street, Cavendish-square, London, W. 1, on Thursday, April 28th, at 8.30 P.M., when Dr. A. Knyvett Gordon will read a paper entitled Certain Difficulties in Life and Sickness Assurance. A discussion will follow. Guests may be introduced on production of a member's private card.

DENTAL RESEARCH.—The Medical Research Council invites applications, not later than May 11th, for two posts in connexion with research work being carried out under the direction of its Dental Committee. Particulars will be found in our advertisement columns.

CHADWICK PUBLIC LECTURES.—A lecture (illustrated by epidiascope) on the Teaching of Industrial Medicine will be given by Sir Thomas Legge, M.D., in the lecture room of the Medical Society of London, 11, Chandos-street, Cavendish-square, London, W., on May 3rd, at 5.15 P.M. Dr. S. Monckton Copeman, F.R.S., will preside. Admission is free.

GIFT TO WARRINGTON INFIRMARY.—This institution celebrates its jubilee this year, and Mr. J. J. Crosfield, of Embley Park, Romsey, Hampshire, has sent a cheque for £10,000 as an endowment.

NORFOLK AND NORWICH HOSPITAL.—A member of the family of the late Dr. Charles Williams has given £1000 to endow a bed in his memory. Dr. Williams was appointed house surgeon in 1858, assistant surgeon in 1869, surgeon in 1878, and consulting surgeon in 1907, the year of his retirement and death.

INSTITUTE OF HYGIENE.—A series of lectures on "Women's Health" will be delivered at this institute, 28, Portland-place, W., on Wednesdays, from April 27th to June 1st, at 3.30 P.M. The first lecture will be given by Dr. Charles S. Thomson on Mental Hygiene in Relation to Women's Health, Lady Carey Evans presiding. Admission is free to all those interested in health problems.

TWO NEW SCHOOLS AT LEEDS.—The Leeds Education Committee is putting up two new schools costing £33,000 each and providing accommodation for 1070 pupils. The class-rooms are designed to secure the maximum amount of sunshine and fresh air during the working day. The windows on the sunny side extend from floor to ceiling, and are made to open completely. Lessons can go on practically in the open air, yet the scholars will be sheltered. All the buildings are only one storey in height.

GLASGOW HOSPITAL FOR WOMEN.—This hospital, which treats nearly 5000 women annually, has just celebrated its jubilee; on this occasion a presentation has been made by the directors and staff to Dr. G. Scott MacGregor, the senior surgeon, who has been connected with the institution for 34 years.

HUNTERIAN SOCIETY.—The annual report of this society records that 30 new Fellows have been elected during the session, and that the Fellows now number 272. Dr. Irwin Moore succeeds Dr. Langdon-Brown as hon. treasurer. The annual general meeting will be held on April 25th, at 94, Harley-street, at 8.30 P.M. Mr. A. E. Mortimer Woolf is nominated by the Council as president for the session 1927–28, and the hon. secretaries, Dr. A. Westerman and Mr. W. E. Tanner, have also been nominated again. The session has been a successful one, and in view of the 200th anniversary of the birth of John Hunter, which takes place next year, it is hoped that next session will be even more successful.

ST. MARY'S HOSPITAL INSTITUTE OF PATHOLOGY AND RESEARCH.—The annual course of lectures on Pathological Research in its Relation to Medicine will be given in the lecture room of the bacteriological department of the Institute on Thursday afternoons at 5 P.M. The programme is as follows:—April 28th.—Sir Almroth E. Wright, F.R.S.: On the Treatment of Bacterial Infections by Antibodies and Chemical Agents. May 5th.—Prof. Carl Prausnitz (Breslau): Experimental Researches on the Nature of the Bacteriophage. 12th.—Dr. R. A. O'Brien: Streptococci—their Toxins and Antitoxins. 19th.—Lt.-Col. S. P. James, M.D.: Some Methods and Problems of Malaria Research. 26th.—Prof. Hugh MacLean: Insulin in the Treatment of Diabetes and some other Nutritional Disturbances. June 2nd.—Prof. C. A. Lovatt Evans, F.R.S.: The Alkalinity of the Blood. 9th.—Prof. B. J. Collingwood: Molecular Movement in the Living Body. These lectures are open to doctors and medical students without fee.

DONATIONS AND BEQUESTS.—Miss Agnes Russell, Muirfield, Castlehead, Paisley, left £1000 each to the Royal Alexandra Infirmary, Paisley, the Paisley Industrial School, the Salvation Army, and Quarries's Orphan Home, and £500 to several other charities including the Paisley Convalescent Home.—Mr. Thomas Cooper, J.P., Kingsland, Shrewsbury, left £1000 each to several institutions including the Royal Salop Infirmary for the endowment of a "Thomas Cooper" bed, and the National Children's Home and Orphanage for a "Thomas Cooper" bed, and £250 to the Eye, Ear and Throat Hospital for Shropshire and Wales.—Mr. Joel Settle, The Hill, Alsager, Cheshire, left £1000 to the North Staffs Infirmary, Stoke-on-Trent. Salford Royal Hospital has received £2000 from the Booth Charities and the Salford and District Nurses' Home, £400. The donations to other hospitals amounted to £1310.

Medical Diary.

Information to be included in this column should reach us in proper form on Tuesday, and cannot appear if it reaches us later than the first post on Wednesday morning.

SOCIETIES.

ROYAL SOCIETY OF MEDICINE, 1, Wimpole-street, W.

MONDAY, April 25th.—8 P.M., ODONTOLOGY. *Paper:* Mr. E. C. Sprawson: Further Investigation of the Pathology of Dentigerous Cysts, with a New Treatment Based Thereon.

TUESDAY.—5 P.M., MEDICINE. Short Communications. Dr. Parkes Weber: Stenosis (Co-Arctation) of the Aortic Isthmus, with Sudden Death from Rupture of a Cerebral Aneurysm. Dr. Morley Fletcher: Two Cases of Co-Arctation of the Aorta. Dr. A. Osman and Dr. Carter: The Prevention of Scarlatinal Nephritis.

WEDNESDAY.—8.30 P.M., SURGERY. Annual General Meeting. Election of Officers and Council for Session 1927-28. A Clinical Pathological Evening will then follow.

THURSDAY.—8.30 P.M., UROLOGY. *Papers:* Sir Thomas Horder: The Medical Aspects of Hæmaturia.

FRIDAY.—4 P.M., DISEASE IN CHILDREN. Clinical Meeting at the Victoria Hospital for Children, Tite-street, S.W. Tea will be served at 4 P.M., followed by a Demonstration of Clinical Cases. 8 P.M., EPIDEMIOLOGY AND STATE MEDICINE. *Paper:* Sir William Hamer: The Influenzal Constitution.

THE MEDICO-LEGAL SOCIETY.

THURSDAY, April 28th.—8.30 P.M. (at 11, Chandos-street, Cavendish-square, W.). Dr. A. Knyvett Gordon: Certain Difficulties in Life and Sickness Assurance, which will be followed by a discussion. Members may introduce guests to the meeting on production of a member's private card.

ST. JOHN'S HOSPITAL DERMATOLOGICAL SOCIETY (Incorporating the London Dermatological Society).

WEDNESDAY, April 27th.—4.15 P.M., a meeting at St. John's Hospital, Leicester-square, W.C. Dr. H. G. Adamson will read a paper entitled Some Remarks upon Treatment of Skin Diseases; followed by a Discussion.

LECTURES, ADDRESSES, DEMONSTRATIONS, &c.

LONDON SCHOOL OF DERMATOLOGY, St. John's Hospital, 49, Leicester-square, W.C.

TUESDAY, April 26th.—5 P.M., Dr. A. C. Roxburgh: Warts.

THURSDAY.—5 P.M., Dr. J. H. Sequeira: Skin Diseases of Animals Transmissible to Man.

ROYAL NORTHERN HOSPITAL, Holloway-road, N.

TUESDAY, April 26th.—3.15 P.M. (at the Royal Chest Hospital, City-road). Dr. L. R. Shore: Muscle Strains in Respiratory Mechanism.

ST. MARY'S HOSPITAL INSTITUTE OF PATHOLOGY AND RESEARCH.

THURSDAY, April 28th.—5 P.M., Sir Almroth Wright: On the Treatment of Bacterial Infections by Antibodies and Chemical Agents.

MANCHESTER ROYAL INFIRMARY POST-GRADUATE COURSES.

TUESDAY, April 26th.—4.15 P.M., Dr. D. E. Core; Examination of the Motor Nervous System.

FRIDAY.—4.15 P.M., Mr. E. D. Telford: Demonstration of Surgical Cases.

Appointments.

HUGHES, AUDREY M., M.B., B.S. Lond., D.P.H. Lond., has been appointed Assistant Medical Officer of Health, Assistant School Medical Officer, and Assistant Tuberculosis Officer, under the York Corporation.

Vacancies.

For further information refer to the advertisement columns.

Birkenhead General Hospital.—Senior and Second H.S.'s. £200 and £150 respectively.

Birmingham, General Hospital.—Bio-Chemist. £500.

Bolton, County Borough Education Committee.—Asst. M.O.H., &c. £600.

Bradford Royal Infirmary.—H.S. and H.P. Each £150.

Bristol, Royal Hospital for Sick Children and Women.—Two Hon. P.'s.

Burton-on-Trent.—Asst. M.O.H. £600.

Cardiff City Mental Hospital, Whitchurch.—Res. Clin. Asst. £52 10*s.* for 6 mos.

Central London Ophthalmic Hospital, Judd-street, W.C.—Hon. Anæsthetist.

Central London, Throat, Nose and Ear Hospital, Gray's Inn-road, W.C.—Hon. Asst. Out-patient Registrar. Also Res. H.S. £75.

Charing Cross Hospital, W.C.—P. to Children's Dept., also Obstet. Reg.

Chester Royal Infirmary.—Hon. Surg. to Ear, Nose, and Throat Dept.

Coventry and Warwickshire Hospital.—Hon. S. and Hon. Asst. P.

Freemason's Hospital and Nursing Home, 237, Fulham-road, Chelsea, S.W.—Res. M.O. At rate of £250.

Guildford, Royal Surrey County Hospital.—H.S. £150.

Hull Royal Infirmary.—Cas. H.S. At rate of £130.

Inverness Northern Infirmary.—Hon. S.

Larbert, Stirlingshire, Royal Scottish National Institution.—Asst. M.O. £350.

Leeds, City of.—Asst. M.O.H. £900.

Manchester City.—Asst. Tuberculosis O. £600.

Manchester Royal Infirmary.—Dickenson Research Travelling Scholarship in Medicine. £300.

Manchester, Salford Royal Hospital.—Med. Registrar.

Manchester, Victoria Memorial Jewish Hospital.—Sen. H.S. (Male). At rate of £250.

Medical Research Council.—Dentist. £500. Also Asst. £250.

Miller General Hospital for South-East London, Greenwich-road, S.E.—Out-patient Officer. £150.

Richmond Royal Hospital, Surrey.—Asst. H.S. At rate of £100.

Royal Waterloo Hospital for Children and Women, Waterloo-road, S.E.—H.S. At rate of £100.

South-Eastern Hospital for Children, Lower Sydenham, S.E.—Res. M.O. At rate of £100.

West London Hospital, Hammersmith-road, W.—Hon. Med. Radiologist. Also Asst. P.

Woolwich and District War Memorial Hospital, Shooters Hill,—Hon. S.'s., P's., Radiologist and Anæsthetists.

The Chief Inspector of Factories, Home Office, S.W., announces vacancies for Certifying Factory Surgeons at Buntingford (Herts), Resolven (Glam.), Mauchline (Ayrshire), and at Burgess Hill (Sussex).

Births, Marriages, and Deaths.

BIRTHS.

AYMER.—On April 15th, the wife of Dr. Aymer, Oakleigh, Grasmere-road, Boscombe, Bournemouth, of a daughter.

CROCKFORD.—On April 14th, at Axminster, Devon, the wife of A. L. Crockford, M.C., M.B., of a daughter.

HARVEY-KELLY.—On April 14th, at Clonhugh, Co. Westmeath, to Sybil Harvey-Kelly, M.B., B.S., D.P.H., and Major Charles Harvey-Kelly, D.S.O., 10th Baluch Regiment—a son.

SHAW.—On April 9th, at Inverleith-place, Edinburgh, the wife of J. J. M. Shaw, M.D., F.R.C.S., of a son.

SHIPTON.—On April 12th, at Buxton, the wife of William Shipton, M.D., J.P., of a daughter.

MARRIAGES.

NOURSE—SARGANT.—On April 9th, at St. Mary's Church, Walmer, Henry Edward Nourse, M.B., B.Ch., to Ethel Millicent, elder daughter of Lord Justice and Lady Sargant, of Generals Meadow, Walmer.

SNELL—CHAPMAN.—On April 18th, at Burnham, Somerset, Norman Snell, M.D., to Evelyn Mary, daughter of the late Horton Chapman and of Mrs. Chapman, of Burnham.

TAYLOR—KENYON.—On April 9th, at Ruyton-XI-Towns, Shropshire, Geoffrey Fawsitt Taylor, M.B., B.Ch. Camb., son of Arthur Fawsitt Taylor, of Hockley, Essex, to Frances Margaret, youngest daughter of Major-General E. R. Kenyon, C.B., C.M.G., R.E.

WALKER—CLARK.—On April 12th, at St. Martin-in-the-Fields, Trafalgar-square, London, Mr. C. Walker, of Percy-terrace, Sunderland, to Elizabeth K. Clark, M.B., Ch.B., Waterhead of Dryffe, Lockerbie, Scotland.

DEATHS.

BEARNE.—On April 12th, Austen Andrew Bearne, M.R.C.S., L.R.C.P., of Tresilian, Falmouth, aged 57.

MATTHEWS.—On April 11th, at Dorset-square, N.W., Dr. Harry Newton Matthews, of Whitehall Court, S.W., aged 51.

MILLER.—On April 18th, Guy Witton Miller, M.R.C.S., L.R.C.P., Killieser-avenue, Streatham Hill, aged 50.

MORTON.—On April 11th, at Pembroke-road, Clifton, Bristol, Andrew Stanford Morton, F.R.C.S. Eng., Consulting Surgeon, Royal London Ophthalmic Hospital, aged 78.

SMITH.—On April 11th, at Mount Rundell, Exmouth, in his 93rd year, Richard Wagstaff Smith, M.R.C.S., L.M., L.R.C.P., formerly of Harborne.

WILLSON.—On Easter Day, at The Homestead, Wetherby-lane, Harrogate, John Wherry Willson, L.R.C.P., M.R.C.S., late of Bradford, aged 59 years.

N.B.—A fee of 7s. 6d. is charged for the insertion of Notices of Births, Marriages, and Deaths.

LENNOX CASTLE AS POOR-LAW HOSPITAL.—Glasgow Parish Council has purchased Lennox Castle and 1300 acres for about £25,000 as a Poor-law institution. The castle, until recently one of the residences of Mr. Peareth-Kincaid-Lennox, was built nearly a century ago, is of great size, and is in good condition. It is some seven miles from Glasgow.

Notes, Comments, and Abstracts.

RADIOLOGY IN RELATION TO COMPENSATION CASES.[1]

BY A. E. BARCLAY, M.D. CAMB., D.M.R.E.,

HON. MEDICAL OFFICER, X RAY AND ELECTRICAL DEPARTMENTS, ROYAL INFIRMARY, MANCHESTER.

MANY will remember the days when an X ray picture was regarded as a pure luxury. In this country the first shadow of the part radiology would take, not only in medicine but in the public mind, was cast by a legal action against a distinguished surgeon. It was a case of shoulder injury in which a clinical diagnosis of a fracture had been made. Later on a radiograph showed that there was a dislocation as well as a fracture, and the lawyers got busy proving negligence for the non-use of X rays. Negligence was proved to the satisfaction of the court and the damages awarded were very heavy. This case, and many others that followed, forced the use of radiology on to the medical profession, willy nilly, if only for their own protection, and to-day thousands of patients are examined radiographically, both in hospital and private practice, not to make a diagnosis but simply to protect the doctor. Certainly this examination often reveals things that were not expected, so that we cannot say that all this work is unnecessary, for clinically we never know in which cases an X ray examination will not be of assistance. Hence it comes about that practically every accident in which there is suspicion of injury to bones passes through the hands of the radiologist. In a large proportion of them the question of compensation is raised, and the X ray evidence is regarded as the deciding factor in the award of compensation.

Radiology in Court.

For the practical purposes of compensation work, the X ray picture is one of bones, the skeletal structures; it takes little or no account of the ligaments and other structures which are of equal if not greater importance as factors producing disability. Perhaps it is not for a radiologist to emphasise this fact, which should be obvious even to a layman, but I have seen so many cases pass through the courts, and compensation awarded, denied or reduced simply on what is shown radiographically, the medical men present assenting, that I feel I must stress this point. Let me take two cases. A lady was injured in a motor smash, and the radiograph showed that not only were the rami of the pubes and ischium shattered on the one side, but that the ilium had slipped up, this being allowed for by a fracture of the sacrum, the outer part of which had gone upwards, probably impacted with the body of the fifth lumbar vertebra. I have seldom seen such an extensive injury, and you can hardly credit it, but it is a fact that this lady walked into my rooms three months after the accident as if there was nothing the matter, although one leg is fully an inch short. I understand that she leads an almost normal life, doing her house work practically unaided. The case is due in the courts this month, and there is no doubt that she will get very large compensation, simply because, anatomically, the injury is so very extensive, although the actual functional disability is astonishingly trifling.

Then we have the miner with a back injury, one of very many similar cases, a man whose sweat pours off him as he gets on to the couch, a man with a family, with every inducement, and apparently with every wish, to be at his work, and in whom we cannot find a trace of any injury to the bones, with the result that he is written down as a "lead swinger," and his compensation is reduced in the hope of forcing him back to work. Not that I consider that all these men are genuinely disabled; far from it; but my point is that the radiographic evidence is not the one and only guide. It is, in fact, most fallacious. Surely it is on the functional disability that compensation should be based and, in my view, far too great weight is attached to the X ray findings in attempting to arrive at justice in these exceedingly difficult cases. The X ray picture with its positive demonstration of bony injury is often the only tangible factor that can be placed before the judge and jury, and it is little wonder that they seize upon this, probably the only definite point that can be raised in the whole case. And just as surely, if the X ray plates do not show any bony injury, the case is prejudiced from the start.

Nothing is more difficult in the whole field of justice than these compensation cases, in which the plaintiff, his legal advisers and, I regret to say it, his medical witnesses also, magnify, wittingly or otherwise, every point that may tell in the plaintiff's favour, while the defence seize every opportunity of depreciating the statements that are made. Justice may indeed be served, but it is handicapped in a manner that frequently makes the path of the applicant far from easy, and leaves many an embittered and seriously disabled man feeling that he has not been justly dealt with. If there is one factor more than another that produces malingerers it is the thought of compensation, and many an honest man, knowing of the fate of others, has stooped to deception of which he would never have dreamed had it not been for the thought of the assessment of his case in a court, and before arbitrators whom he knows he must try to impress with the severity of his disabilities. There is something wrong with the whole system, particularly with the part played in it by medical men who, even with the best intentions, cannot but be partisans. I have even known a case in which a medical man, giving evidence in a case of neuritis, stated that there was no X ray evidence of this complaint, a point on which, by no stretch of imagination could the X ray examination throw a particle of light. I do not wish to belittle the value of the X rays in medicine, but I hold very strongly that the place of radiology in compensation is often on a wrong footing, being regarded as a court of appeal by consent of all concerned, whereas it is only competent to give information as to skeletal structures, and, in the nature of things, can hold next to no knowledge of function and vital processes.

Assessment of Disability out of Court.

I should like to see the whole of the medical side of all cases dealt with, and the disability assessed, outside the courts of law by medical men who are entirely independent. The medical referee is a step in the right direction, but I would go further and divorce the assessment of disability entirely from the legal liability side of the case, by the establishment of competent tribunals under the chairmanship of a well qualified and experienced medical man. These tribunals might be empowered to accept written medical opinions or take evidence from medical men themselves if necessary. The patient would be examined by them, and they would assess the disability, unhampered by the legal, the sentimental aspects, and the partisanship that are inevitable under the present system. It is accepted by the courts that the medical man is the proper person to give an opinion on this vital subject of disability, yet he stands in the box as a witness for the plaintiff or the defence. The result is seldom satisfactory to the medical man, for, in the mass of mixed medicine and legality, with its quibbles, it is almost a chance whether the judge and jury take an over-serious or over-lenient view of the case. The chanciness of the verdict and the assessment of damages are a ruling factor in the minds of all lawyers who deal with these cases. I have frequently heard it stated that it would be no use bringing the case forward if So-and-so were the judge, but that there would be a good chance in another court, meaning thereby that one judge set less store by the statements of expert medical witnesses than did the other judge. This chanciness was particularly well brought out in an assize case a few years back, in which a lady had received a severe acute burn of her neck from the application of X rays in a large hotel, where a progressive management had installed a plant, and placed it in the hands of the bath attendant. It was a severe burn, and one that would certainly leave considerable disfigurement, but, in all probability, little else. We sat in consultation with counsel in his room before the opening of the case. A message came from the counsel for the defence for a conference, and presently the counsel for the plaintiff came back to ask advice as to whether to settle or not for what I considered a very large sum plus costs. The decision to accept was based, not on the disability and disfigurement, but on the possibility of cancer occurring in the scar, and the effect of such a possibility on the mentality of the judge who was sitting. The defence, we found afterwards, were quite certain that the cancer possibility would be a strong point in the pleadings, whereas the experience of the radiologists advising the plaintiffs was that they had never known cancer to occur in the scar resulting from an *acute* X ray burn, and they had advised strongly that this possibility should not be stressed. Had it not been for the uncertainty on the purely medical side, and the legal argument that would probably have centred about a remote and probably negligible possibility, the damages in this case would have been of a much more modest nature, and, I think, justice would have been better served.

It would not, I suppose, be possible completely to divorce the medical side of the case from the legal, but, in such an instance as this, the medical side could be tried and witnesses called before a medical tribunal, and the independent medical chairman of that tribunal would be the one and only medical man who would be called in the legal proceedings, which would thereby be considerably shortened. So also in the ordinary workman's compensation pleadings, the

[1] Being the substance of a post-graduate lecture given at the infirmary.

disability would be assessed on a percentage basis in relation to the man's employment, and this would be given to the court *after* it had determined the purely legal side of the liability, any further information being provided by the independent chairman of the medical court. Incidentally, such a scheme, if it were practicable, would save the hard-wrought medical man from many weary hours, or even days, waiting in or about the courts for a summons to go into the witness-box. In many of the compensation cases there is no legal side at all; to bring these cases into the courts purely for an assessment is costly, and often unsatisfactory. I understand that in America the expense took on such proportions that the insurance companies could stand it no longer, and, presumably by mutual consent, they set up their own medical scheme, the medical officers of the societies concerned assessing the disability, with the result that this type of litigation has been reduced to reasonable if not negligible proportions.

Conclusions.

The X ray plate only shows skeletal structures, yet it is often used in Court as the deciding factor in compensation in cases in which the injury may be one of the soft parts which do not show on the plate. Too much reliance is placed on the X ray evidence in cases of injury. The time has come when the system of assessing compensation in a legal court should be reconsidered, and it is proposed that the disability should be assessed before a purely medical tribunal whose evidence should be presented to the legal court by an independent medical chairman.

DRUG ADDICTION IN KOREA.

A REPORT on the treatment of morphia addicts in Chosen (Korea) has recently been issued by the Japanese Government.

Opium-smoking has long been common in Chosen, especially in districts adjoining China. The former Korean Government tried to suppress the habit, but without much success. After the Japanese annexation, however, strong measures were taken to suppress it, and at the same time medical treatment was given to addicts. Their number gradually decreased and the situation so much improved, that in September, 1914, the Government decided to adopt absolute prohibition. As many addicts as possible were collected for medical treatment, and the result is that to-day opium-smoking has been all but suppressed in Chosen.

At the same time, however, there has been a rapid increase in the number of persons using morphine, cocaine, and other similar drugs. It is stated that this practice was originally taught by foreign missionaries to addicts of opium-smoking so as to rid them of their habit. Be that as it may, the extent of the vice is now serious, and the authorities have made an order prohibiting the use of the drugs in the provinces, where it is most common. In coöperation with local philanthropic bodies, they are also taking steps to cure addicts. In Keiki, for instance, an infirmary has been established at public expense since 1925, where compulsory and general medical treatment is given. The results at this and other centres are described as excellent.

As might be expected, however, there are many patients who relapse after treatment, and it is considered next to impossible to suppress drug-taking unless rigorous measures are adopted. Addicts, moreover, are generally adept in tempting others, and it is feared that the vice will again spread. With a view to its complete suppression, the Government of Chosen is therefore considering a plan to enforce medical treatment of addicts throughout the peninsula, and mete out severe punishment to anyone using morphine and other dangerous drugs.

THE APPROACH TO PAINTING.[1]

Mr. Bodkin is a Trustee of the National Gallery of Ireland, and has probably had borne in upon him, as it is borne in upon most of those who direct or take charge of big public collections, that a vast proportion of those who go to look at pictures do not enjoy themselves as they might, not having any proper ideas of the way to look, of what to expect and, in short, of how to derive pleasure through the eye. The book is divided into two parts, in the first of which a series of chapters describes the philosophical, the analytical, the technical, and the casual approach of pictures, and concludes with an amusing description of what is called "the approach by siege." The advice is given in this chapter to discard the view held by many critics and some princes of art that ability to appreciate painting is a chance gift, and to recognise that the more experience of life that is brought to assist the judgment of the spectator the better will be the chance of sharing with the painter his meaning, and so of appreciating his work fully. The recommendation is given to sit down before a picture, to besiege it, to rack it with questions, rather than to approve it or reject it in a brief scrutiny or for other than reasons that appear satisfactory to the inspector. The second part of the book describes this method when applied to some 20 famous pictures ranging in date through early Florentine art, the Venetian epoch, the Flemish, Spanish, and French schools of the seventeenth and eighteenth century, and ends with an analysis of a popular portrait by Gainsborough and a famous landscape by Corot.

[1] The Approach to Painting. By Thomas Bodkin. London: G. Bell and Sons, Ltd. 1927. Pp. 192. 7*s*. 6*d*.

WAS SPALLANZANI A PRIEST?

IN his Discourse at the Lister Centenary Prof. W. Bulloch quoted a famous saying of Lazzaro Spallanzani giving him the title "Abbate." A correspondent wrote to inquire whether it is now beyond doubt that the great naturalist, physiologist, and scholar had also taken holy orders. Prof. Bulloch replies: "There is no doubt as to the correctness of calling Spallanzani 'Abbate.' He is so designated, sometimes Abate, sometimes Abbate, on all his works. I have before me as I write:—

1. Fisica animale et vegetabile del Sig. Abate Spallanzani, 1782.
2. Dissertazioni di fisica animale e vegetabile dell Abate Spallanzani, 1780.
3. Dei fenomeni della circolazione dell Abbate Spallanzani, 1773.
4. Dell' Azione del Cuore ne vasi sanguigni dell Abate Spallanzani Sacerdote della Congregazione della B. vergine, e S. Carlo di Modena.

"Pavesi's book entitled 'L'Abbate Spallanzani à Pavia 1901,' contains an exhaustive examination of the documents relating to Spallanzani in Pavia. He tells us (p. 11) that 'he officiated daily at mass at S. Epifanio which proves that he had taken holy orders.' When mass was stopped at S. Epifanio, Spallanzani asked to be transferred to the mass at Jesus, which was the University Chapel after the Expulsion of the Jesuits. It has not been found where Spallanzani was ordained, but it is probable that he became a priest at Reggio when a young man.

"Some years ago," Prof. Bulloch continues, "I went rather fully into this question with an eminent legal authority on the Catholic Church who told me that unless Spallanzani had been ordained as a priest he could not possibly have taken part in a mass as we know he did. Of course he is often called Abbé, which was a kind of courtesy title in France, not necessarily an ordained priest. The French word 'Abbé' is not an exact translation of 'Abbate,' nor is our English 'Abbot.' Hence I thought it best to give Spallanzani the title which he himself used."

ADVICE TO GIRLS OF SCHOOL AGE.

Dr. Hilda Halliday has written a small book[1] on health and habits for the use of senior girls in elementary schools. In style and scope it is admirably suited to its purpose, and as Prof. H. R. Kenwood says in his foreword, it will help to make young girls realise the need for self-preparation for the duties of life, and direct their minds to a purpose and duty in motherhood which is all too little recognised.

This is one object of the book; another is to offer practical advice to girls who often have considerable responsibilities in guiding the early stages of development of younger members of the family. The infant's first lessons are connected with the formation of good physical habits—regular hours for sleep, feeding, bodily functions, and exercise—and a basis of such habits is to lead on to a superstructure of good principles. Dr. Halliday is no believer in the theory that everything is to be made soft and easy for the child; rather he is to be encouraged to develop resource, pluck, self-control, and a sense of fair play—qualities which he is usually ready to display until he has been spoiled by the interference of adults. "Children are courageous about pain unless they are 'let down' by their elders"; "Remember that he (the four-year-old) is an intelligent person, and don't put him off with a snub or an untruth"; "A promise made to a child must be kept, or else a reasonable explanation must be given"—these are ideas which are well worth implanting in the adolescent mind.

The book is attractive in appearance; it has short chapters with inviting titles, the type is clear, and the excellent illustrations are reproduced from old masterpieces. The ground covered is necessarily limited, and some supplementary instruction on such matters as the control of the body and the emotions—hardly more than hinted at by Dr. Halliday—will need to be given. But the teaching is sound and is calculated to appeal to the elder school-girl, in whose hands the book may safely and profitably be placed.

[1] Little Mothers and Big Sisters. By Hilda M. Halliday, M.R.C.S., D.P.H. London: Humphrey Milford, Oxford University Press. 1926. Pp. 79. 1*s*. 3*d*.